NAVIGATING IN THE CLOUDS

Enhancing the Selection Process of a
Personal Cloud Storage

BY ROSA WAHL

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ABSTRACT

Through the increased use of mobile devices, people are taking photos and shooting videos more than ever before. When combined to the files stored in computers, the overall amount of personal and valuable digital content is growing rapidly. To preserve and organise the massive amounts of data various methods such as external hard drives have been utilised, but combining and storing content from different devices, can be a laborious task. Cloud storages such as Dropbox and Google Drive have gained a wide popularity amongst consumers but the competition in the area is steadily growing and new services are appearing to the market on a steady pace. While privacy regulations and feature selections vary in each Cloud, selecting a suitable Cloud storage can be difficult for consumers.

In this thesis, the goal was to explore the area of a Cloud storage from an user experience point of view, and to discover means to ease up the selection process of a suitable Cloud storage for personal needs.

Literature review as well as previous experience gained while working in a development team of a Cloud storage formed a base for understanding the possibilities and challenges associated in the selected topic. In addition, a selection of Cloud storages were benchmarked to gain further knowledge about the recurring solutions and features. Online surveys and interviews were utilised to obtain diverse perspectives and insights about the usage of Cloud storages.

The final concept consists of a web- based service that allows users to search a Cloud storage based on the included features and the content of the legal agreements. High fidelity user interface visualizations were prepared to represent the visual side of the concept. In addition, ideas for further concept development are presented to support the outcomes of the thesis.

Keywords: Cloud storage, User experience Design, Service Design, Benchmarking

ACKNOWLEDGEMENTS

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CONTENT

1. INTRODUCTION

The purpose of this chapter is to is to give a general introduction of the thesis work. Within this chapter, thesis topic and research questions will be introduced along with the background and personal motivation that has lead to the selection of the topic.

1.1 SECURITY IN CLOUD

The popularity of Cloud storages has increased remarkably during the last couple of years and new service providers are constantly appearing on the market. Mobile phones have become an everyday accessories to western people and phones are being used to create and share content almost as much as they are used to make calls. The demand for high quality photos and videos taken with mobile devices has increased the pressure for mobile phone manufactures to add up the storage capacity of the devices, leading to the situation that mobile devices have become comparable to external hard drives that contain wide range of personal information in forms of photos, videos and documents. For users carrying large amounts of personal data on their mobile devices that are easily lost or stolen is not an ideal situation, and this is where the Cloud storages come into the picture.

Today, the selection of different Cloud storages is larger than ever before and users are put in front of a complex task of selecting a service that is suitable for their needs. The selection of features offered by the different service providers vary from automatic backup to polished photo galleries and social features, with many products focusing only on the certain features. For the user it is often a task of trial and error through installation and account creation process to see whether the product is qualified for the intended purpose.

With the media filled about news of privacy violation scandals taking place all over the world, it is not an easy task for many users to trust a Cloud storage enough to fill it with their personal data. When selecting a suitable Cloud storage, the reputation of the service provider, the ways of marketing and the user experience when using the actual product are, together with various other aspects, crucial when the decision to install and use a product is made.

1.2 THESIS TOPIC

This thesis project focuses on examining user experiences (UX) in an area of a public Cloud storage. A goal was to identify the aspects that affect users perceptions about the service quality, and recognise the key elements that recur in the most popular Clouds in the market today. Through background study and research phase the aim was to recognise service possibilities that would make it easier for users to select a suitable Cloud storage based on their personal needs.

The thesis results in a proposal of a concept that is supported by related literature, user surveys and unstructured interviews. In addition, several topics for further design-related research were obtained in an area of a Cloud storage.

1.3 PROJECT BACKGROUND

I started working in F-Secure Corporation as an User Experience Graphic Designer in May 2013. F-Secure is an anti-virus, computer security and Cloud content company based in Helsinki, Finland that was founded in 1988. Being globally known for its trusted IT security solutions for both private and corporate use, and for being one of the first antivirus companies to establish a presence in the world wide web, F-Secure has declared a strong trusted position both in Finland and worldwide.

A year before I joined the company, F-Secure launched a Cloud storage solution called Content Anywhere that was made available for customers through mobile operators worldwide. Content Anywhere allowed users to backup their content from any desktop- or mobile device into a secure, encrypted Cloud storage, and access the content from any device, any time (Cloud Software Finland, 2012). In late 2013 Content Anywhere was renamed and rebranded as Younited and, in addition to operator market, offered also as a direct consumer product.
Located in Finland and operating under Finnish privacy laws, Younited was advertised as a safer option for the American competitors to store and share content without fear of the prying eyes of government (Younited 2015).

My work as an UX graphic designer for Younited consisted of taking care of the visual look and feel of the application on both desktop- and mobile clients. In addition to visual aspects, I worked closely with the rest of our UX- team on designing and developing new and existing features for Younited. For product development some of the commonly used methods were design workshops, user- testing sessions and competitive benchmarking.

A benchmarking method was used to keep track of competitive services and ongoing trends. New services were examined individually and the findings were then shared and evaluated during workshops that were held within a team. Often benchmarking was targeted to a certain features that existed in Younited to evaluate different solutions and to gain fresh ideas for feature development. Competitive benchmarking is used when a company wants to evaluate its position within its industry. It is a process for identifying, understanding and adapting practices from other organizations that are considered to be best-in- class. (Stroud 2010).

During 2013-1015 a wide range of Cloud storages from both US and EU- area were examined with a focus on new innovations, features and solutions that have an impact on general user experience and usability of the product. A strong focus was also on the first time user- experience and how the taking into use- process was carried out from the perspective of users with no technical background. It was often noticed that the overall quality of the Cloud storage consists of not just technical implementations but various elements, that might cause the user to feel uncomfortable about using the product as a whole. While the selection of different features inside Cloud storages is wide and evenly growing, the way the features have been implemented can play a crucial factor for the users who are selecting a Cloud storage for themselves based on

the feature offerings. The topic of this thesis derived from these findings.

1.4 OBJECTIVES AND RESEARCH QUESTIONS

This thesis aimed to answer to the following research questions:

1 How can benchmarking be used as a method to examine different features and how features affect the users' perceptions about the overall quality of the service, in an area of public Cloud storage?

The work begun from assumption that due the wide selection of different Cloud storages available, choosing a Cloud based on personal needs can be challenging for consumers. One way for the Cloud services to differentiate themselves from one another are the feature offerings and the way the features have been implemented. The variety and quality of the features play an important role for consumers when talking about maintaining user's interest to adopt a Cloud service. The feeling of quality is build from various elements in functionality- and user interface- level that together form the unified entity.

One of the objectives of this thesis was to find out how a benchmarking- method could be used as a tool for designers to examine and recognise the recurring gaps in user experience between products that offer similar features to consumers.

2 How could the research findings be implemented to ease the selection process of a suitable Cloud storage for the users?

The second objective of the thesis was to examine the possibilities of a concept that could help users to select a suitable Cloud for their personal needs.

2 BACKGROUND STUDY

The purpose of this chapter is to introduce the term Cloud Computing and explore the benefits and privacy threats that are present in the deployment models targeted for consumers. In addition to literature review, general information and personal insights gained while working in F-Secure are also covered.

2.1 STORING OF VALUABLE DATA

From the day computers were created they have been used to produce and handle content in various forms. Today, private computers around the world are being filled with data in great speed. While the world is moving towards digitalization, computers are used to store files as much as they are used to create files. Confidential documents like account statements and bills that used to be delivered as paper prints are now being delivered in a digital format, and valuable prints such as certificates, contracts and receipts are scanned to be stored more securely. Computers are also used to store memories in forms of videos and photographs that are meant to be kept safe for a long periods of time.

In 2015, people are taking more digital photographs than ever before. The increased use of portable devices like smartphones and tablets have changed the habits of creating and handling photos all over the world. Based on report created by eMarketer (2014) nearly two billion were using smartphones worldwide in year 2014. It has been estimated that between 2013 and 2017, mobile phone penetration will increase from 61% to 69% of the global population and by 2017, nearly 80% of all photos will be taken with smartphones (Worthington 2014).

Figure 1. Subway passengers using mobile devices.

Smartphones can easily get lost, stolen or broken. The importance of creating a backup of the files located on a computer is evident for majority of the users, but concerning the amount of data that people store on their mobile devices, having a sufficient backup plan also for mobiles is crucial. Backing up files manually from a desktop-and mobile device on a regular basis is a laborious process for users, and it is often forgotten until something happens to the device and the data is gone for good. One of the most common method to backup data from a computer is to set up a backup profile to perform automatic backups into an external hard drive. Both Mac and PC- computers contain a pre-installed program for this particular purpose but in case of a corrupted data, this option may not be as helpful (Briggs 2009).

The way people store and share data has changed radically during the last couple of years. Based on a study conducted by Jaakkola et al. (2013, 10) in 2010, only 20% of the respondents understood the meaning of a Cloud storage and what they are used for. Today storing files in a Cloud is slowly becoming a standard rather than a peculiar exception. (Jaakkola et al 2013.) From a mobile perspective Cloud services that offer both manual and automatic uploads are one of the most convenient way to backup files. Instead of storing photos and other file formats in a mobile device, files are being copied into a Cloud making it possible to free up space in the device.

Since the term Cloud is a much more wider concept than a file storage and backup, the following chapter introduces the area of a Cloud Computing, and where and how Cloud Computing can be implemented to serve various purposes of use.

2.2 CLOUD COMPUTING

Internet has become a part of everyday life for the majority of consumers. It has been estimated that today around 40% of the world population has an Internet connection and the number of internet users has increased tenfold from 1999 to 2013, reaching three billion users in 2014 (Internet Live Stats 2015). Together with the fast development of Internet and new IT- solutions, new innovations and practices have been introduced along the way, one of them being a Cloud Computing. The history of Cloud Computing begins in the 1960s when an idea of everyone on the globe to be interconnected and accessing programs and data at any site, from anywhere, was created by a computer scientist J.C.R. Licklider. After sixties few of the biggest milestones in Cloud Computing was the arrival of Salesforce.com in 1999 which pioneered the concept of delivering enterprise applications via a web site, and 2009 when browser- based applications such as Google Apps were brought to market by Google and other cloud companies. (Mohamed 2009.)

Cloud Computing is a general term for services that are hosted over the Internet. It means storing and accessing data and programs over Internet instead of user's personal hard drive. The term Cloud Computing was taken to use as an umbrella term around 2008 when new services permitted computing resources to be accessed over the Internet. Before this, a cloud symbol had been used to represent Internet on network diagrams for several years already. (Barnatt 2010, 4.)

Cloud Computing services have had a major impact on how Internet has evolved into what it represents to users and how it is being used today. Cloud Computing offers numerous advantages such as scalability, lower costs, fast deployment and ubiquitous network access (Afshari 2014). Some of the most well known services that use Cloud Computing are:

Backup Services:
Solutions for storing various forms of content such as photos and videos offsite into a Cloud- based servers. The storage space can be scaled up based on user's needs, and

the content can be accessed from any desktop- or mobile device that has an Internet connection. Some of the most well known Cloud storage services are Dropbox, Google Drive and Microsoft OneDrive.

Social Networking:
Probably one of the most used type of Cloud Computing. Some of the most famous examples of social networking services are Facebook, Twitter, LinkedIn and MySpace that are accessed through a Website. The primary use of social networking is to find people you know or people you would like to know, and get connected with them (Gordon & Marchesini 2010).

Email:
One of the largest area of a Cloud Computing are web- based email services. Through Cloud Computing services like Google Mail, Hotmail and Yahoo! can take care of housing all the hardware and software necessary to support user's personal email accounts. (Huth & Cebula 2011.) Users are able to access their email from any computer by logging in to the service, and store a certain amount of data in forms of text and email attachments in their personal account.

Healthcare:
Health care is one of the rapidly growing areas of a Cloud Computing. An increasing percentage of hospital executives are storing data, including clinical applications and email, in the cloud (Terry 2012). Storing data such as electronic health records, radiology images and genomic data offloads a burdensome task from hospital IT- departments and makes it possible for facilities in various geographic areas to share and access life-saving information more quickly (Cloud Standards Customer Council 2012).

2.2.1 Deployment Models

A National Institute of Standards and Technology (NIST), a part of U.S Department of Commerce, has listed a different deployment models for a Cloud Computing:

- **Private Cloud:** An infrastructure that is created for exclusive use by a single organization comprising multiple consumers (e.g., business units). It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises (Mell & Grance 2011). Private Cloud model offers a greater control and privacy for the organization by being accessible only by the members of the organization in question.

- **Public Cloud:** Public Cloud is a cloud infrastructure that is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. Public Cloud is the most recognisable cloud model for many consumers through widely known services like Dropbox and Google Drive. Public Cloud exists on the premises of the cloud provider. (Mell & Grance 2011.) Even though Public Clouds can offer

wide variety of features including scalability, reliability and performance, the main difference to a Private Cloud model is that public clouds do not have the same security levels or service level agreements that Private Cloud companies can offer (Syntax 2013).

- **Community Cloud:** An infrastructure that is used together by several organizations. Management can be handled by the community itself or a third party, and it may exist on or off premises (Mell & Grance 2011; Salo 2012, 17-19).

- **Hybrid Cloud:** Cloud infrastructure which is a composition of two or more distinct Cloud infrastructures (private, community, or public) but are bound together by standardized or proprietary technology that enables data and application (Mell & Grance 2011).

2.2.2 Service Models

Cloud Computing is often described as a stack to represent the broad range of services build on top of one another under the term 'Cloud'. Cloud Computing consists of three fundamental service models:

1. **SaaS: Software as a Service.** In SaaS- model, consumers are able to access the software applications over the Internet. No software installation is required. (Reese 2009, 3.)

2. **PaaS: Platform as a Service.** A category of Cloud Computing that provides platform and environment for developers to build applications and services over the Internet. (Interoute 2015.)

3. **IaaS: Infrastructure as a Service.** In IaaS- model, a virtualized hardware and all of the infrastructure components are provided as a service by a third- party

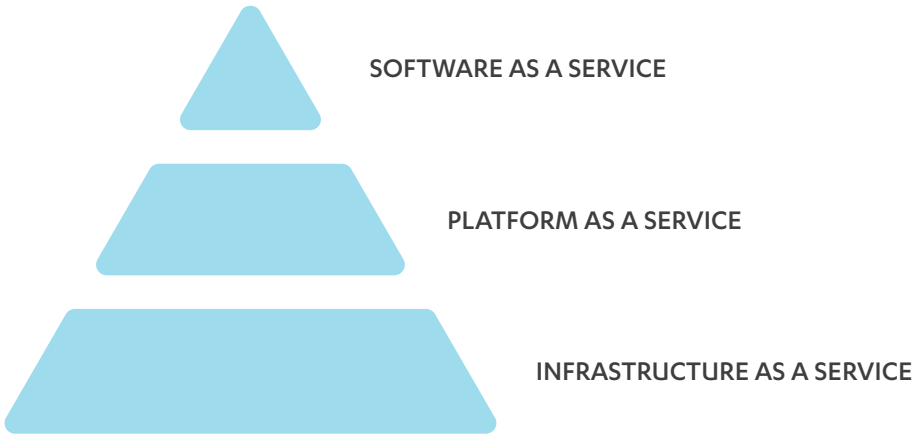


Figure 2. Cloud Computing stack diagram showing three distinct categories within Cloud Computing.

"If you can walk into any library or internet cafe and sit down at any computer without preference for operating system or browser and access a service, that service is Cloud-based" (Reese 2009, 2).

The thesis will focus on the service models Public Cloud (a) and SaaS (1) which together form the service model that is known to majority of consumers through Cloud storages like Dropbox, Google Drive and Microsoft OneDrive, often under the name 'Cloud storage' or just simply a 'Cloud'. Within this thesis, the area of a Cloud storage is explored by first examining the the benefits and challenges through literature and case examples, and then diving into the feature level of a selection of new and emerging Public Cloud providers.

2.3 CLOUD AS A PERSONAL BACKUP

When compared to storing files to external hard drive, Cloud storages offer a multiple benefits for users in addition to a plain backup. Cloud storage can be defined as a service model that offers a scalable storage space for the users and ability to access the saved data over a network. A National Institute of Standards and Technology (NIST), a part of U.S Department of Commerce, has listed five essential characteristics of a Cloud storage:

- **On-demand self-service:** User can unilaterally provision computing capabilities, such as network storage and server time, and pays only for the additional features if they are needed. (Mell & Grance 2011; Salo 2012, 17-19). One common user scenario is the need for more storage space after testing a free service with storage limitations. User is able to access the current service plan through settings, add billing information and purchase more space without contacting the actual service providers. User is also able to cancel a subscription or delete an account at any time.

- **Broad network access:** The Cloud capabilities are available for users through multiple devices like desktop workstations, laptops, mobile phones and tablets. Services adapt to devices that are used, not other way around. In ideal situation, user can access the cloud anywhere when a connection to internet is available. (Mell & Grance 2011; Salo 2012, 17-19). Users are able to upload various forms of data from their mobile devices, such as photos, contact information and text messages, into a Cloud storage. In addition of releasing a storage space from the device, the files are stored in Cloud in case the device had been lost by the user.

- **Resource pooling:** The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. Examples of resources include storage, processing, memory, and network bandwidth. (Mell & Grance 2011). Users that are using the same service can have

access to different features based on their subscription plans and individual settings.

- **Rapid elasticity:** Capabilities can be provisioned and released, often automatically, to scale rapidly outward and inward commensurate with demand. For consumers the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time. (Mell & Grance 2011.) This often makes it possible for users to test different features without permanent commitment and add new feature releases into their service plan when those are available. Applications are also ready to use once the user subscribes to the service.

- **Measured service:** Cloud resources can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service. This ensures that the user pays only for the capacity that is being used and the billing for it will be accurate. (Mell & Grance 2011; Salo 2012, 17-19.)

2.3.1 Social Features

In addition to the characteristics listed by NIST, the list of beneficial features Cloud storages offer is evenly growing together with the development of computing and mobile technologies, and through new services that appear to the market. According to Jaakkola et al. (2013) social aspects play an important role when examining reasons for consumers to begin using a Cloud storage. Some of the social features that are commonly available in Cloud storages are following:

- **Sharing:** Based on the studies conducted by Jaakkola et al. (2013) the ability to share photos with friends and family has become one of the primary reasons for users to upload photos into a Cloud. In addition to sharing photos, users are sharing memories and experiences and at the same time, looking for an emotional and social experience by doing so. (Jaakkola et al. 2013.) By using Cloud storage users are able to share files and folders by providing a link to the files for the receiver. These links can be customised with various rights that determine whether the receiver is able to edit, remove, share or download the files, or just view them. Links can be protected with a password and a timer to specify the amount of hours or days the link will remain active. Instead of sending files as email attachments, Cloud allows sending large file sizes or whole image galleries without consuming the quota of the receiver's email account.

- **Collaborative functions:** Many Cloud storages offer a possibility to create a shared folder to share files amongst other users, such as co-workers or family members. A common feature is also the ability to edit, remove or leave a comment to the file. One example is Google Docs in which users are able to work and edit the same text document simultaneously from different geo-locations and through different devices. According to Jaakkola et al (2013) once the web of connections has been created through a certain service, these connections become the primary value for the user and the main reason for user to continue using the service.

- **Tagging:** To annotate and categorize content within a Cloud, users can insert tags to group content. Tags can be used to replace the traditional folder structure or used together with folders for more specific sorting. A single file can contain multiple tags which can be individually searched within a Cloud.

Some file types such as photographs include metadata that can be used to tag files, such as geolocation. A handful of Cloud storages allow users to insert a geotag manually and sort the content based on geo- locations. This is a beneficial feature for the photos that do not include geolocation within the metadata, such as photos taken with a mobile phones that do not have have built in GPS*. "The data usually consists of coordinates like latitude and longitude, but may even include bearing, altitude, distance and place names" (Janssen 2015).

** Global Positioning System. A space-based navigation system that provides location and time information into a device.*

A facial recognition can also be used to tag files. Some Cloud storages include an automatic facial recognition to group photos based on people appearing on the photos, or allow users to tag people into the photos manually.

2.4 SECURITY AND PRIVACY THREATS

Despite the benefits that are included when storing files into a Cloud storage, data security threats are also included. A confidential data stored in a Cloud can leak and be used by a third party, or end up being corrupted or destroyed due to bugs, a server malfunction, operator errors or misconfigurations. (Ada Popa et al. 2011.) A malfunction in data communications can prevent users from accessing the Cloud service and their data permanently for a certain period of time. In case of a company transaction a third party might grant access to all servers that were owned by the original service provider. (Reese 2009.) The lack of security support has delayed the adoption of Cloud storage services especially for cautious consumers and enterprises. The recent successful attacks on different Cloud storage providers have exacerbated these concerns. (Borgmann et al. 2012.)

In June 2008, a popular Simple Storage Service (S3) by Amazon suffered an internal failure and several user's data was corrupted. Amazon eventually admitted the failure and blamed a faulty load balancer that caused the service to corrupt single bytes in the byte stream. (Amazon Discussion Forum 2008.) At the same year a Cloud storage called The LinkUp was shut down after losing 45% of their customers data. Nirvanix, a company who was managing The LinkUp's servers and storage, denied any responsibility of the data loss. (Brodkin, 2008.) Also in 2008 an employee of a Cloud hosting company Flexiscale accidentally removed proportion of their user's data while doing basic maintenance tasks. (Salo 2012, 38.)

In 2009 Google announced that some of the users of Google's Cloud based Documents and Spreadsheets products have been inadvertently shared with contacts who were never granted access to them. Despite the fact that the documents were only shared

to people with whom the users have previously shared a document, the incident was seen as a major privacy leak by many users. (Kincaid 2009.)

2.4.1 Auto-Upload Function on Mobile Devices

As mentioned in chapter 1.1 the benefits of automatic upload function on mobile Cloud applications are evident. Despite the benefits privacy risks are also included. Many phone manufacturers like Apple and Samsung include a preinstalled* Cloud solution in their devices that automatically transfers photos and other formats such as contacts, passwords and browser bookmarks into a Cloud. In Apple's iPhones and iPads user can easily enable the iCloud function without being fully aware of the automatic upload function. Similarly in Android devices, in case the user has opened a pre- installed Google + application and agreed to the prompt, user's photos are automatically being transferred into Google's servers and into a Google+ service. In Microsoft's Windows Phone photos are uploaded into Microsoft OneDrive in case user has selected this option during the setup phase of a new phone.

** Software that has been installed into the device by manufacturer.*

Often on mobile devices the automatic upload feature can easily be turned on by the user and then forgotten. This leads to the situation where sensitive photos which are deleted by the user during a photoshoot, are transferred into a Cloud without warning. For users who are aware of the auto upload feature it can be laboursome to sign in into the Cloud service and delete the unwanted photos manually.

2.4.2 License Agreements and Privacy Policy

When installing a new Cloud software users are often requested to accept the End User License Agreement (EULA), in order to be able to proceed with the installation procedure. The purpose of EULA is to give the user a permission to use licensed material which is usually under a copyright of the service provider, and to provide the terms by which the user may use a copy of a protected work. (Beal 2015.)

A Terms of Service (TOS) is often included to EULA, or vice versa. TOS is a legally binding contract that refers to a complete set of broader terms that govern a user's use of a service. TOS is often used with services that store user's personal data. While terms of service are subject to change and vary from service to service, they have gained an increased amount of public awareness together with criticism.

Together with EULA and/or TOS, a Privacy Policy document should be provided to explain how an organization handles any customer, client or employee information gathered in its operations. According to best practices, the policy should disclose if data may be shared with or sold to third parties and if so, what the purpose is (Haughn 2013).

EULA together with TOS is a legal one on one- agreement between a manufacturer and a customer which should be carefully examined like any other contract, but still most of the users do not take time to read them. Typically EULA consists of text which length can vary from one to more than 40 pages, and which often contain legalese – difficult English meant at lawyers rather than ordinary people. (Zukerman 2011.) Accepting the terms in EULA without familiarising with it first might potentially harm consumers in many ways. By clicking "I Agree" service provider might be granted access to collect various information about the user and the usage of the product, install product updates or pop-up advertisement to users computer automatically and claim rights to the content that has been uploaded into the service. (Scambusters 2015.) While registering to online services such as a web client of a Cloud storage, the legal documents such as EULA and Privacy Policy are often placed behind a link on the account creation phase and automatically accepted in case the user creates an account to the service.

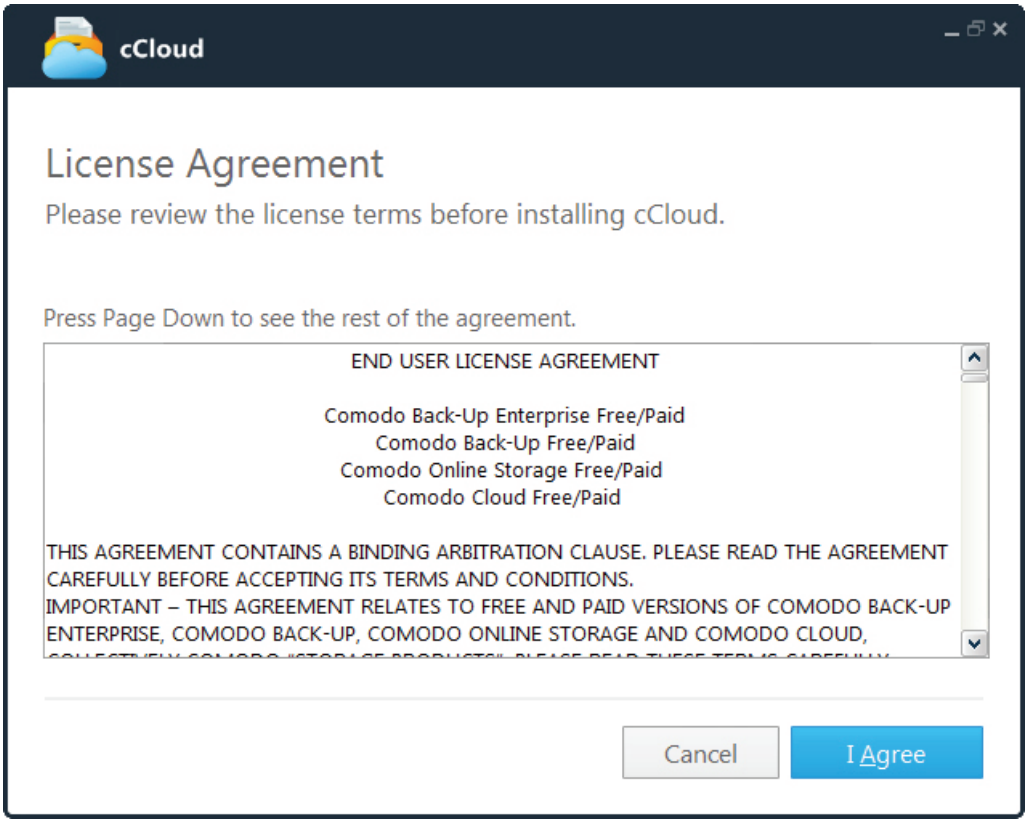


Figure 3. End User License Agreement of a Comodo Cloud Storage.

EULA can also include a disclaimer of liability for faulty software, meaning that consumer cannot file class-action lawsuits against the vendor in case the product does not work in a way that is was being marketed. Currently popular EULA term is to make consumers agree not to reconfigure their computers to remove the installed software. This is because many vendors are supporting their free versions of their products by packaging them with third-party programs that serve advertisement or gather information about consumer habits for marketing companies. (Newitz 2005.)

Despite the privacy threats mentioned above, it is worth mentioning that while the privacy violation cases like the ones described are becoming more common, the

increased negative media visibility is placing a lot of pressure for both existing and new service providers to tackle these kind of problems more seriously and ensure the safety of their user's data in the future. (Salo 2012, 38.)

2.4.3 Responsibilities of Users

Using a Cloud storage is supposed to increase the feeling of the data being stored safely in case of a hard drive failure, theft or an accident such as household fire. When using a Cloud storage user is transferring part of the responsibility of storing the files to a service provider and expects a certain level of security and privacy measurements while doing so. (Heino 2010, 94.) While malicious security breaches are often made by attacking a certain faults of the service infrastructure, sometimes part of the responsibility is pushed towards users by the service provider. In 2012, hundreds of Dropbox user accounts were hacked by accessing user names and passwords from third party sites and used them to access the Dropbox user's accounts. Dropbox has since put in place additional security controls to avoid a repeat occurrence and advised users not to use a same password on multiple sites. (Kerr 2012.) In 2014, media was filling with news about more than 100 celebrities having their iCloud accounts hacked and explicit photos being published online. In it's official statement Apple denied any breach in any of the company's systems including iCloud, and that the certain accounts were compromised by a targeted attack on user names, passwords and security questions. Like Dropbox, Apple advised users to use stronger passwords and two-step verification* method to protect their personal accounts. (Apple, 2014.)

**In addition to password, a verification code or a security key is required in order to log in to account.*

Due the increased privacy attacks, users have been advised with various ways how to protect themselves from a data theft and their files being misused. Reese (2009) advises users who are selecting a suitable Cloud provider for themselves or their companies to examine how the service providers are treating physical, network and host security. Reese also encourages users to encrypt* all data before uploading it into the Cloud. Salo (2012) advises users to make sure that the service provider offers a way to easily export all saved data in usable form in case the service doesn't fulfill user's requirements. To ensure the safety of personal information, making sure that the service allows full account deletion is also encouraged.

**A process of encoding information in such a way that only a person with the encryption key can read it.*

Performing the recommended security actions mentioned is too much to expect of regular users since additional knowledge about information technology and how to handle data is required. It can also be assumed that requesting or recommending these actions to be performed directly by service providers can have a negative effect on user experience and cause users to suspect the security of the service in general. It can also be stated that understanding the security measurements and privacy policies of different Cloud providers and comparing them can be laborious even for a specialist working in the field of Cloud computing.

2.5 CHOOSING A CLOUD STORAGE

When searching for a phrase “Cloud storage” on Google, approximately 76 900 000 results was found. (Google 2015.) For regular home users who are looking for a online storage to backup family photos and other memories, changes for effectively evaluating and comparing multiple Cloud providers are low. A common method to choose a Cloud storage is to select a service that is already connected to the operating system, such as iCloud by Apple and OneDrive by Microsoft (Jakobsson 2015). During Younited user-studies that were conducted in Helsinki during 2013-1014, majority of the participants were using either Google Drive or Dropbox while being aware of the privacy threats associated with them. Reasons for the selections varied from good usability to the amount of free space and multi-device support.

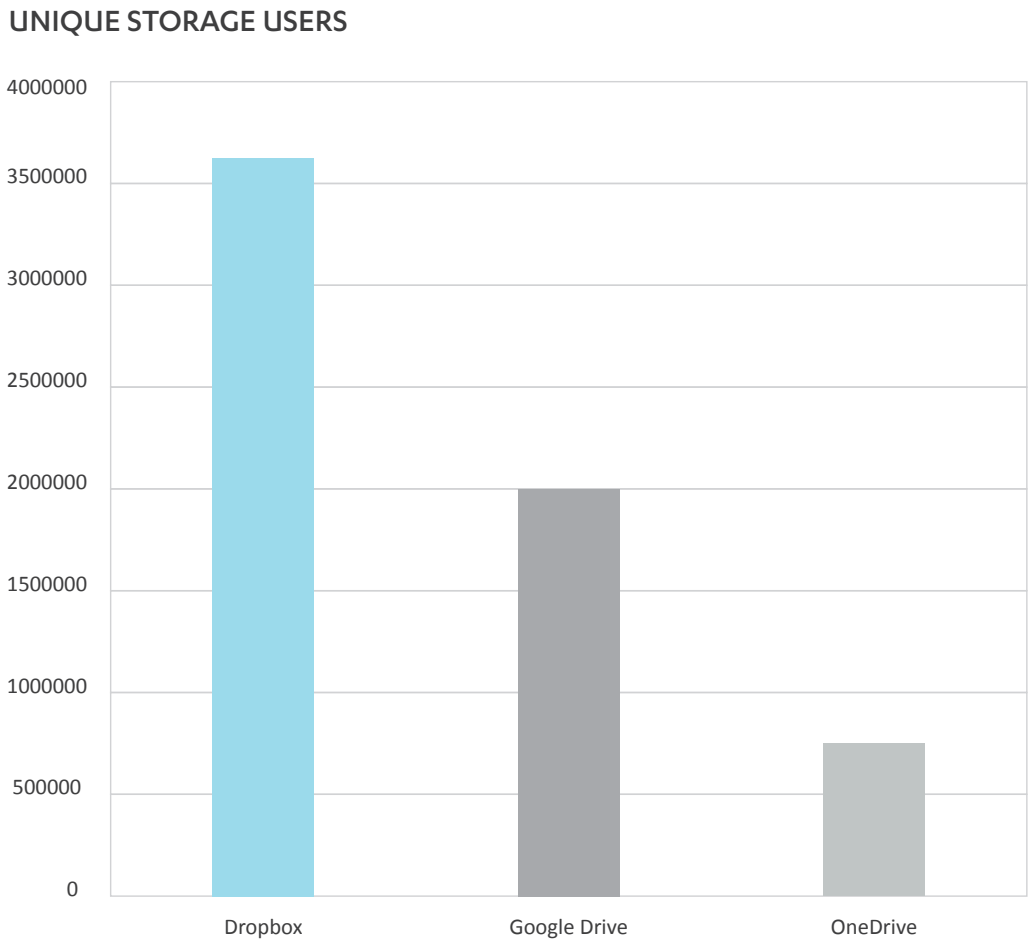


Figure 4. Leading Cloud Storages in NASDAQ, 2014.

The competition between the leading Cloud providers is tough. In March 2014, Google lowered the price of their monthly storage plans and increased the maximum size of an individual file up to 1 terabyte. The following month Microsoft responded and upgraded the storage space of OneDrive up to 1tb for all of the Office 365 subscribers. On late august 2014, Dropbox joined the war and upgraded the storage space to 1 terabyte while keeping the prices same. On september 10, Microsoft announced that they now support files up to 10gb while doubling their syncing speed. (Bennion, 2014.) While the benefits regarding to storage size and price are obvious, choosing a Cloud storage can get confusing for consumers. For users who have stored a large quantities of data in the Cloud, switching to another Cloud vendor is laborious and time consuming. Also when consumers focus is on price and storage capacity, the security and privacy measurements that vary between the service providers are easily ignored.

During user- studies it also became clear that users prefer Cloud services that are well known and also used by people around them, such as friends and family members. Based on the studies conducted by Jaakkola et al (2013) even the services that are perceived not so trustworthy are used because the benefits are seen to be greater than the possible security and privacy breaches. Challenges that are related to security and privacy do not prevent the adoption and use of these services when the motivation for using the service is otherwise high (Jaakkola et al. 2013). While careless behaviour can be seen amongst the users of Cloud storage, based on Jaakkola et al (2013) it can be assumed that in the long run services that ensure good security and privacy will have a competitive advantage over the ones in which people do not feel safe.

2.5.1 Looking for Alternatives

When looking for an alternatives for the leading Cloud storage providers, users are merely able to base their decision on possible recommendations and reputation, and seek further knowledge from written and verbal reviews. The company website and how the cloud offerings such as the list of available features, the amount of free space and the price for an upgrade have been presented there can play a major role for the user. Based on Rodriques (2013) new smaller Cloud storage providers are regularly appearing on the market but struggle to remain in business because of the hard competition in the area.

A personal insight gained while participating into the benchmarking sessions together with the rest of the UX- team in F-Secure was that many Cloud storages offer similar sets of features to their customers but how the features have been implemented and how security and privacy aspects have been taken into consideration, varies considerably between different service providers. Since creating an account (together with accepting the EULA) is often required before the user can use the actual service, testing and comparing several different Cloud storages is both time consuming and precarious.

Comparing different Cloud storages can be challenging for consumers due insufficient

product descriptions in company websites. What was also noticed during benchmarking sessions was that several websites included charts and diagrams to describe the product functionalities but images and screenshots of the actual product were missing. Customers who have special visual requirements, such as large thumbnails for photographs or a simple user interface, are forced to either create an account or try to search images of the product elsewhere. Without screenshots, people with disabilities such as color blindness cannot preview the product to determine whether the accessibility guidelines have been taken into consideration.

Based on Salo (2012, 36) The possibilities for users to evaluate the performance of a Cloud storage other than using a pure observation are limited. It is difficult and often impossible for users to be able to gain precise information about the technical solutions of the Cloud service provider. Observation- based evaluations that affect users opinions about the service can be formed through various actors, such as error situations, delay times on transitions, inoperative elements in user interface, visual mistakes such as overlapping or blurry visual elements and generally bad UX- decisions.

2.6 GENERAL INTRODUCTION TO USER EXPERIENCE (UX)

Based on Law et al (2008) while the term user experience (UX) is commonly used in a field of product and service design, a common definition and a unified view for UX is still missing. As listed by Law et al, the term user experience is often used as a synonym for usability, user interface, interaction experience, interaction design, customer experience, web site appeal, emotion, wow effect, general experience or as a general term to describe all or a combination of many of these aspects.

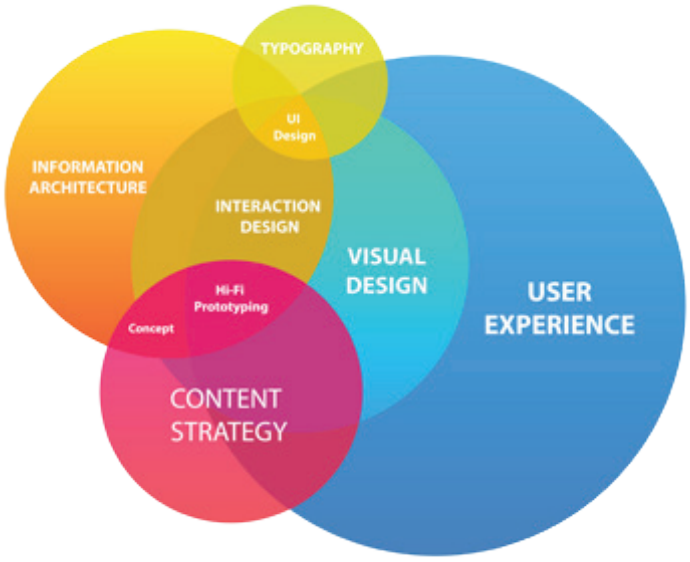


Figure 5. User experience map.

One widely used definition for UX is the one created by Jakob Nielsen and Don Norman (2012):

"User experience encompasses all aspects of the end-user's interaction with the company, its services, and its products. The first requirement for an exemplary user experience is to meet the exact needs of the customer, without fuss or bother. Next comes simplicity and elegance that produce products that are a joy to own, a joy to use. True user experience goes far beyond giving customers what they say they want, or providing checklist features. In order to achieve high-quality user experience in a company's offerings there must be a seamless merging of the services of multiple disciplines, including engineering, marketing, graphical and industrial design, and interface design."

When talking about user experience, the context is often related to the need to evaluate whether the overall experience of a service, product or an individual feature is either good or bad. For designers the user experience is something that is constantly improved based on information gained from off-the-shelf analysis, A/B tests* and surveys, and most importantly from user testing sessions and customer feedback. One significant method to improve the user experience of a product is to compare it to other similar products or services in the market which have been successful amongst consumers or gained a positive feedback about any of the UX areas shown in figure 5.

** A method of comparing two versions of a design by reviewing them with users, to see which one results a better conversation rate.*

2.7 GENERAL INTRODUCTION TO BENCHMARKING METHOD

Benchmarking, also referred as Competitive Benchmarking and Systematic Benchmarking, is a process that is used by companies to compare a product, service or a process to the ones offered and used by market leaders in the field. Since the early 1980's many of the world's largest corporations have used Benchmarking to increase their competitive advantage. (Bengert & Rooney 2015.)

Based on Karlöf & Östblom (1993, 7) Benchmarking can be used to evaluate company's own effectiveness of productivity, quality and working methods by comparing them to the performance of the best-in-class organizations. The information gathered can then be used to identify gaps in an organization's processes in order to achieve a competitive advantage. Through Benchmarking a company can achieve dramatic improvements in operating performance by studying the practices of leading- edge organizations and then replicating those practices. (Bengert & Rooney 2015). Benchmarking is also used to evaluate industry standards to ensure the competitiveness of the company.

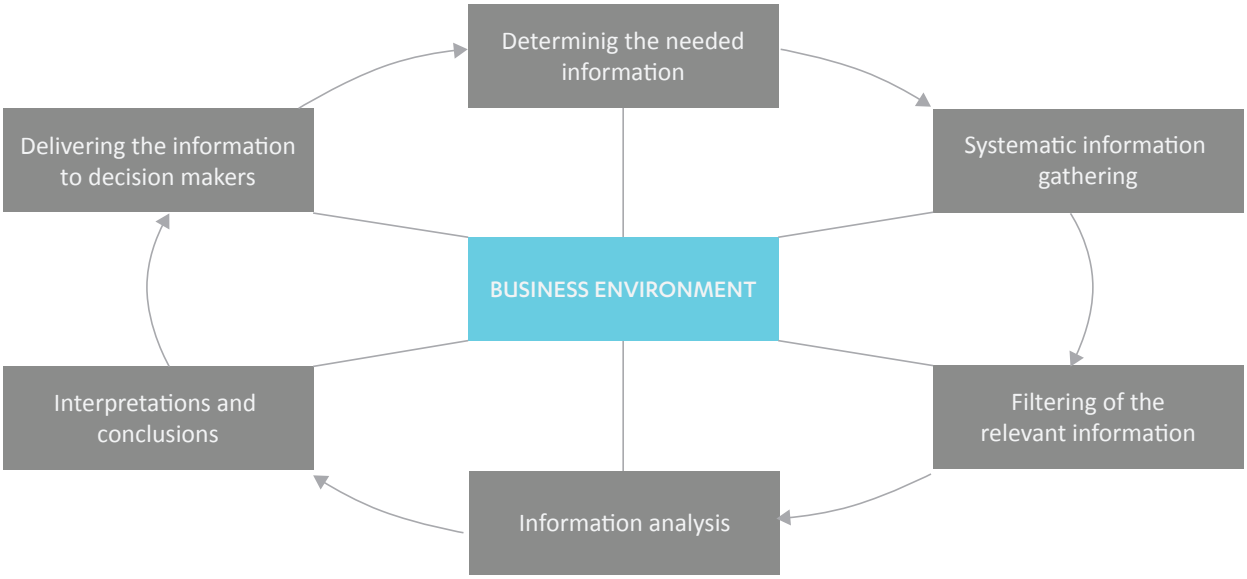


Figure 6. Benchmarking is often a continuous and systematic process.

According to Pirttilä (2000, 18) the benchmarking process begins from the decision of what kind of information will be gathered for the company to be able to proceed with the decision making. The next goal is to acquire this information effectively from different sources such as field studies, interviews and surveys and finally separate the obtained data that is considered to be relevant and reliable. After the evaluation phase the newly obtained information is forwarded to the decision makers who will then apply it as needed to improve the business.

Based on Karlöf & Östblom (1993, 46) the three distinctive types of benchmarking are internal benchmarking, external benchmarking and functional benchmarking. When using internal benchmarking, comparisons are made within a corporation to examine various industry sectors such as offices, sales groups and sub-companies. In external benchmarking corporate operations are compared to other companies such as local competitors and international market leaders working in the same field. In functional benchmarking different industries and their products or processes are compared among each other in purpose of finding excellence in the area that is being examined.

2.8 BENCHMARKING USER EXPERIENCES

As stated by Roto et al. (2009) the technical reliability of products is often taken by granted and users start to look for products that provide engaging user experience. It can be argued that when the offering of similar products in the market is wide and growing, the way these products differentiate from one another, how an individual product qualifies to user's personal needs and requirements, and most importantly, how the product matches or exceed the user's expectations are the key factors when talking about maintaining user's interest towards a product.

For usability evaluation, applying benchmarking method to examine performance measures such as task execution time and and the number of errors is well justified. Instead, when examining user experiences and how the user feels about the system, the basic benchmarking techniques becomes insufficient. Nevertheless, as stated by Vermeeren et al. (2010) the relationship between usability and UX is intertwined and usability is subsumed by UX. Vermeeren et al also state that UX evaluation entails the augmentation of existing methods for usability evaluation.

Since user experience is a subjective and focuses on lived experiences, collections and categorization of UX evaluation methods are rare (Vermeeren et al. 2010). Several of the reported methods emphasise the importance of using multiple different techniques to collect data in a wider scale. Roto et al (2009) explain that it is beneficial to combine objective observation data with user's insights from interviews and questionnaires.

In this thesis, when discussing about benchmarking user experiences through features in Cloud storages, a method of functional benchmarking together with user questionnaires were used in order to gain wider perspective regarding to the aspects that affect the usability of the selected Clouds.

2.9 INSIGHTS FROM THE BACKGROUND STUDY

Performing a background study has helped me to create a deeper understanding of the area of a Cloud Computing and to better comprehend the scale of the usage of Cloud based solutions around us today. By combining the the background study with the existing knowledge gained while working in F-Secure, a better comprehension about the uncertainty of consumers while evaluating and selecting Cloud storages for personal use was acquired.

Even though a well selected Cloud storage can easily offer a satisfying user experience for users, the means to find a suitable service are limited. Albeit Cloud storages offer a wide variety of features for different purposes, the way these features have been

executed and what opportunities they provide to users to view, modify and organise their content varies greatly. Consumers who are searching for a Cloud storage based on their feature offerings can miss potential new services because of lack of advertising or due to insufficient information provided about the service in general.

While searching and testing multiple Cloud storages, users are exposed to privacy and security threats due the process of account creation and accepting legal agreements without further examination. To be able to examine the EULA and other legal terms that determine the security and privacy aspects as well as service provider's rights to access users content, an unconscionable amount of knowledge is required from the user to be able to find and evaluate the information in question. Users easily rely on service providers that are used and recommended by friends and acquaintances and trust these services until a pivotal occurrence such as personal privacy violation or an favourable offering from other service provider takes place.

Through background study and personal insights, design proposals were identified. To further understand the possibilities to enhance the user experience when selecting and using a Cloud storage, a selection of Cloud storages were benchmarked from the UX perspective.

3 CASE STUDIES

In this chapter, selected Cloud storages are benchmarked and evaluated based on the purpose of use, usability and security aspects as well as features that are being included.

3.1 CHOOSING BENCHMARKING TARGETS

The Cloud storages that were selected for the benchmarking were Copy, Irista, Thislife and MediaFire.

Figure 7. Logos of the benchmarked Cloud storages.

The examined Cloud storages were chosen mostly based on the services that were benchmarked during the UX- workshops in F-Secure. By selecting the same Cloud storages I was able to utilise the expertise of other UX- designers into the research in a form of personal notes created during the sessions. To be able to use the screenshots and personal notes that were created while working for F-Secure, a permission was granted by the Design Manager I was working for at that time. A second criteria for the selected Cloud storages was the feature selection and customer promises advertised on a company website. The aim was to gather a selection of Clouds with a wide range of different offerings and diverse target audience.

The bigger and widely used Cloud storages such as Google Drive, Dropbox and Microsoft Onedrive were intentionally left out from the scope in order to focus on smaller emerging services with new offerings in the area of a feature selection.

3.1.1 Defining boundaries for the Evaluation

To be able to limit the amount of data gathered for the purpose of this thesis, boundaries needed to be defined. Most Cloud storages offer applications for both desktop and mobile devices, as well as an online application that can be used from any computer or a device that has an internet connection. Since all of the content that has been uploaded from desktop- and mobile applications into the Cloud can also be viewed online, the web application was considered to be the most versatile client to be examined for the purpose of this thesis.

Since many Cloud storage users use more than one application to upload and access their content, examining also desktop- and mobile applications would have produced wider outcomes about how users experience the services and included features. Although desktop- and mobile applications have been left out from the research scope of this thesis, examining all of the applications while conducting research related to features in Cloud storage is well justified.

The areas examined within benchmarking were determined based on the customer journey of discovering a new service and establishing it into use. The benchmarking will be going through the following phases of user interaction:

Website
Privacy policy / Terms of Service
Account creation
Taking into Use
Adding Files and Folders
File- Specific Actions

Benchmarking was conducted by using screenshots and making notes while proceeding through the different phases of utilising a Cloud storage.

3.2 BENCHMARKING OUTCOMES

The full benchmarking review is included in the Appendix section of this thesis. In addition, the following chapters will summarise the benchmarking outcomes for each Cloud storage being examined:

3.2.1 Copy

Website: The general look and feel of the Copy website provided a positive first impression of the service provider and increased expectations towards the actual product. Still the lack of description about what kind of use the Copy is targeted for and for who is it designed for, together with the lack of screenshots of the actual product and a full list of features creates a gap between the product and a consumer. When an immediate connection between the customer promises and consumers is missing, potential users might start to look for similar services elsewhere.

Feature selection: Copy offers a Cloud storage with basic features that are common in the majority of cloud storages available in the market today, but at the same time many useful features had been left missing. Copy accepts multiple file types and adding folders, but being able to view the files only through list view without clear thumbnails to describe the content of files and folders had a negative effect on the user experience as a whole.

Although the possibility to share files was not listed in the Copy website as a part of feature selection, two separate methods was included for sharing. The social features were limited to the possibility to give receivers rights to download and share the file.

Security and privacy: Accepting the terms and privacy policy of Copy gives the company a permission to access a wide range of personal data such as usernames, passwords and phone numbers and provide the information to third parties. The collected data also includes personal information of the people who the user has shared files with by using Copy.

3.2.2 Thislife

Website: The look and feel of Thislife website is colourful and rich with information. A strong emphasis is on the product video that is looping in the background which efficiently draws user's attention to the features and functions and summarises the core idea of the product effectively. The website includes screenshots of the actual product and a video displaying the usage of the product features and closer look to the user interface. For consumers who are uncertain about what Cloud product to choose, a chance to preview the actual product before creating an account can have a great impact on the decision making. Included features are also well represented on a website, and a comparison to other Cloud storages offers a valid selling point for consumers looking for a Cloud storages for their personal needs.

Feature selection: Thislife offers a versatile selection of features that easily distinguish the product from the leading competitors in the market today. The traditional folder structure has been replaced with tags, geo-locations and facial recognition that can be used to organise and sort content in an easy and appealing way, and the timeline offers a quick way to view photos that probably would not be viewed so often otherwise.

Security and privacy: Creating an account to Thislife will grant rights for Shutterfly company to access users personal information such as name, address, phone number and email address as well as results from surveys and competition entries, and use them for various purposes such as marketing and advertising. In case mobile application has been installed, information such as location, device model and IP address will also be gathered.

All of the user- specific information that has been gathered can be provided for third party companies for marketing purposes. Nevertheless the user will be provided an option to prevent the information spreading by contacting Shutterfly via email. The content that has been uploaded into the service by user in forms of photos and videos will remain private.

3.2.3 MediaFire

Website: The look and feel of the MediaFire website is youthful and visually appealing, which increased the expectations towards the actual service. Nevertheless the lack of detailed descriptions about the features that were included to the free version of the product were missing completely. Screenshots of the product were replaced with a vector mockups looking unlike of the actual product, which can be considered misleading for consumers.

Feature selection: The feature selection of MediaFire feels concise and narrow, although some of the features have potential to distinguish the service from competitors. One of these features is sharing which includes a wide variety of different possibilities to share content. Files can be published through most of the major social media services as well as blogging platforms. Files can also be embedded into a HTML code by using a readymade embed code and available embed sizes. Unlike many competitors, MediaFire does not include a function to import files from social media sites or other Cloud storage services.

The service felt slow and unresponsive at times which affected negatively to the overall user experience. When navigating from one view to another a new browser tab was opened causing a slight confusion about how to move inside the service.

Security and privacy: Accepting the MediaFire Privacy Policy the company is granted access to various types of personal information as well as permission to share the information with third parties. When discussing about maintaining privacy of the uploaded content, interpreting the contradictory information between Terms of Service and Privacy Policy becomes difficult. While the Terms of Service states that a full ownership of the uploaded content remains with the user, The Privacy Policy indicates that any content uploaded to MediaFire becomes published content. While published content is handled in the contract as non-personally identifiable information, it can be shared with third parties. For consumers with sensitive content a further investigation regarding of the privacy aspects should be encouraged.

When downloading a file from MediaFire, an external webpage full of advertisement is opened. This might cause uncertainty about what is actually being downloaded, and whether the downloaded file has remained private. It was also noticed that the client did not include any actions for account deletion. In case user is willing to delete an account, the service provider needs to be contacted via email.

3.2.4 Irista

Website: The look and feel of the Irista website is attractive and appealing and the main purpose as well as target group are easily recognised. Nevertheless the site lacks a full list of included features as well as pricing and the amount of available storage space. Whether the service is free or not, stays unclear until the account has been

created by the user.

Feature selection: Moving within the service feels difficult at times because of the lack of back- buttons inside the views. Only way to return to the previous view was to use the back- button of the browser, which caused
the service to completely log out user a couple of times. Also organising files by creating albums and adding tags to files occasionally felt tedious because of an order the tasks needed to be performed.

Some of the biggest limitations of Irista is the ability to share files only through social media. For consumers who want to be able to share individual files or folders privately to selected people, Irista does not live up to expectations. What also surprised was the lack of video support. Since the majority of cameras manufactured by Canon include the ability to shoot videos, the lack of this feature can be both surprising and pivotal for some consumers.

Security and privacy: Creating an account to Irista will allow Canon to access various sorts of users personal data and share the information with third parties. Nevertheless user has an opportunity to prevent the information spreading by contacting the company.

Although the Privacy Policy states that the company will not claim right to the uploaded content, reading the document further reveals that the material uploaded by user can be used for the purpose of providing the Irista service to consumers. To do this, Canon together with associated companies will grant non-exclusive and sub-licensable rights to access to users content as well as to publish and reproduce the content as long as the user uses the Irista service.

Unlike other Cloud storages benchmarked for the purpose of this thesis, Irista is the only service storing files in Europe instead of USA. Referring to the privacy violations that have been taking place in United States because of NSA, the fact that the data centers are not under American indeterminate privacy laws can have a great effect on the decision to use Irista for many consumers.

4 ANALYSIS

In this chapter, the insights gained from benchmarking are analysed and categorised in order to find common factors that affect the general usability when searching and using a Cloud storage.

4.1 SWOT- ANALYSIS

A SWOT- analysis- method was used to categorize the information that was gained during the benchmarking of Cloud storages. SWOT is an useful tool for understanding opportunities and threats in organizations, businesses as well as products and ideas. SWOT is an acronym for Strengths, Weaknesses, Opportunities, Threats. Strengths and Weaknesses are regarded distinctly as internal factors, whereas Opportunities and Threats are regarded distinctly as external factors (Chapman 2015).

COPY SWOT- ANALYSIS

	HELPFUL	HARMFUL
INTERNAL ORIGIN (attributes of the service)	**STRENGTHS** • Supports multiple file types • Stored files will remain private • Visually appealing website •Smooth transitions inside the product increase the feeling of quality • Flexible file sharing • Invite To Copy- festure can be used to earn more storage space	**WEAKNESSES** • Uninformative website is lacking a selling point • Specified target audience is missing • Files can be viewed only through a list view • Thumbnails are visible only for photos • Narrow selection of included features
EXTERNAL ORIGIN (attributes of the environment)	**OPPORTUNITIES** • As a widely recognised and reviewed service, a stronger market position could be achieved with small improvements	**THREATS** • Company is granted access to user's personal information • User's personal information is granted for third parties • No data export tool in case of an account deletion • Terms can be modified without notice

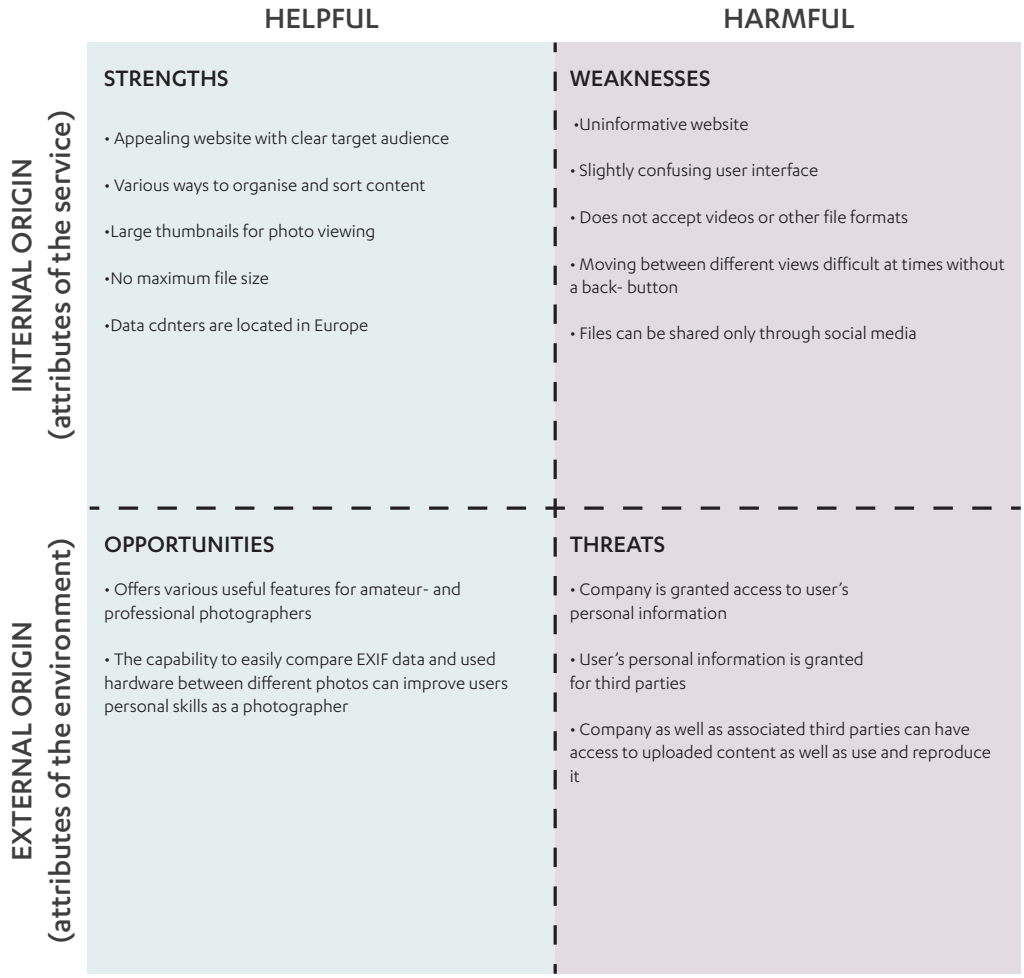
THISLIFE SWOT- ANALYSIS

	HELPFUL	HARMFUL
INTERNAL ORIGIN (attributes of the service)	**STRENGTHS** • Unlimited free storage for photos • Informative website with product screenshots and a video • Onboarding wizard and contextual tooltips support first time users • Includes traditional tags, locations and facial recognition to be used to organice photos • Stored files will remain private • In case user is not willing to share personal information with third parties, contacting Shutterfly will make users personal information private	**WEAKNESSES** • Supports only photos and videos (after upgrade) • Supports only JPEG image format • A separate program needs to be installed to be able to upload files • Adding tags, locations and faces manually is laborous and time consuming
EXTERNAL ORIGIN (attributes of the environment)	**OPPORTUNITIES** • Strong feature selection differentiate the service from many competitors • Offers a fresh alternative to sort photos based on locations and people instead of folders • Being small and fairly unknown service to many consumers, stonger marketing would be needed for increased customer base	**THREATS** • Company is granted access to user's personal information • User's personal information is granted for third parties • Company together with third parties will be granted access to a device specific information such as phone model and geolocation • Results from surveys and contests can be granted for third parties • Terms can be modified without notice

MEDIAFIRE SWOT- ANALYSIS

	HELPFUL	HARMFUL
INTERNAL ORIGIN (attributes of the service)	**STRENGTHS** • Versatile file sharing options • Accepts multiple different file types • Individual files can be published by using HTML embed code and a list of embed image sizes • User is able to request help or report errors through client • Files can be viewed by using a list view or a thumbnail view	**WEAKNESSES** • Confusing user interface • User is expected to familiarise with an 11- page PDF to get started with the service • User interface feels slow and unresponsive at times • New browser tabs are opened while moving inside the service • Collaboration feature feels concise and unfinished
EXTERNAL ORIGIN (attributes of the environment)	**OPPORTUNITIES** • A great service for people who publish content online (bloggers, web stores) and need a place to store photos and videos	**THREATS** • Company is granted access to user's personal information • User's personal information is granted for third parties • Privacy Policy and Terms of Service hard to interpret- The privacy of uploaded content is unclear • Download- view opens in an external webpage full of adertisement • In orer to delete account, user is required to contact the company via email

IRISTA SWOT- ANALYSIS



Figures 8-11. SWOTS- analysis of benchmarked Clouds.

SWOT- analysis was being considered an efficient tool to be used while benchmarking. After completing a written review for each Cloud, SWOT- analysis was used to categorize the findings into a specific sectors. In addition of making the collected information more structured, SWOT- analysis helped to identify similarities in internal and external factors between the examined Clouds.

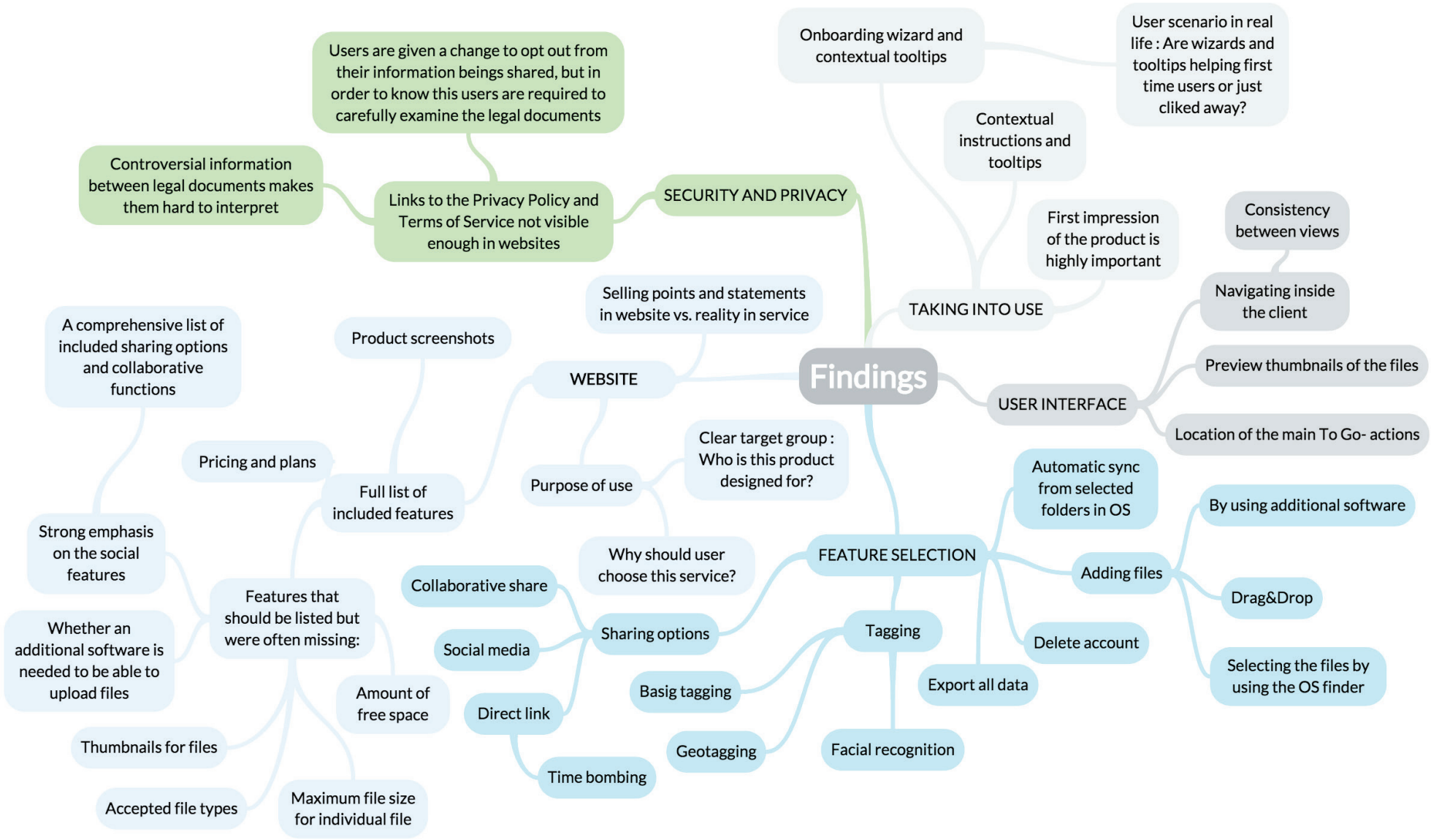


Figure 12. Mind Map of the insights gained from benchmarking.

4.2 CATEGORIZING INSIGHTS

A Mind Mapping- method was being used to categorize the findings gained from SWOT- analysis into a focus groups which were then used as a guidance for the rest of the thesis progress. These focus groups came out as following:

Lack of product information in websites

During the benchmarking it was being noticed that in websites, indicating clearly for whom the product is targeted for and for what purpose it has been designed for could ease up the selection of a Cloud storage from user's perspective. The benchmarking supported the statement made earlier in the background research, that while all Cloud storages included a certain selection of features, the way these features have been implemented vary greatly and can benefit users in different ways.

A comprehensive list of included features was missing from majority of the websites and features such as available sharing possibilities, accepted file types, the scale of included collaborative functions and organising files with tags were revealed to the user only by using the service. One example is MediaFire which offers a scale of sharing possibilities but also include a feature to embed image or a video with a direct HTML-code into a blog or website. While being a beneficial feature for many web publishers, nothing about this feature has been mentioned on a website and in a list of features. Another similar example is Thislife which includes a comprehensive set of features but does not allow direct uploads through web client. In order to upload files user is required to install a separate software to computer. This limitation makes it impossible to upload content into the service from public computers which usually do not allow software installations. This again is a feature and a limitation that has been left out from the feature list visible in the website and only revealed to users through a product usage.

The lack of realistic screenshots and preview images was present in half of the benchmarked Clouds. Together with insufficient product and feature descriptions, user might end up creating an account to a service that eventually fails to fulfil the expectations and requirements user had towards a file storage.

In some of the cases also the main product information such as pricing, available storage space and maximum file size were not present in the main page of the website but instead placed on the subpages not directly visible for consumers. Seeking such information from product websites can become frustrating for those who are comparing multiple Clouds based on feature selection and pricing.

While benchmarking Clouds, public reviews that were currently available online were also briefly explored. It was put on mark that most of the reviews were written in a positive tone with the service quality and feature selection praised. However in many cases viewing comments of the articles revealed a complete opposite response from

the users of the product, with some suspecting that the review has been ordered and possibly dictated by the service provider itself. Whether this is true or not, relying on public reviews when selecting a Cloud storage might include a risk of the results being impartial.

Difficulties with Terms of Service and Privacy Policy

Links to the Terms & Conditions and Terms of Service- documents were without exception placed on the bottom of the website in small print although including crucial information about the usage of the the user's personal information and for whom the obtained data will be shared. Often written in legalese together with a small font size, these lengthy documents are difficult for regular consumers to read and fully understand.
Some of documents contained an option to opt out from the personal information being shared with third parties, but in order for the user to notice it, familiarising with the documents in great detail is required. Some of the Cloud's document also contained controversial information about the usage of the stored content. In some of the cases, while Privacy Policy stated that all rights to the uploaded content remains with the user, The Terms and Conditions- document stated otherwise.

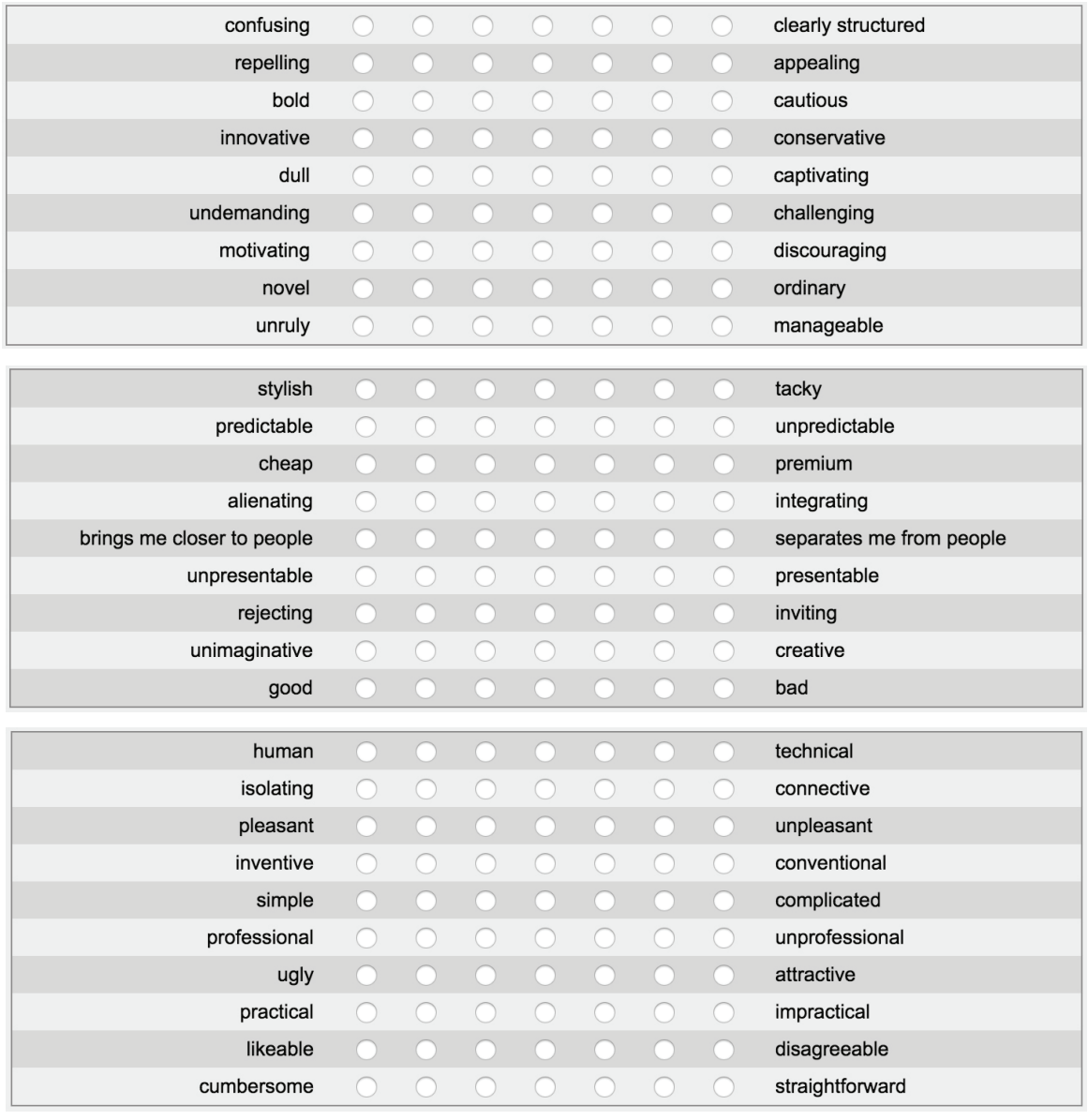
Feature selection

While the most commonly used features in Cloud storage applications such as file sharing, folders, basic file editing tools and connecting to social media services such as Facebook were included in almost all of the benchmarked Clouds, the versatility and additional functions within these features varied greatly between services. Amongst the benchmarked Clouds, the feature 'sharing' for example might mean the option to share only through social media accounts such as Facebook and Twitter, or options to share via email or a direct link. Sharing- feature could also include a wider selection of capabilities such as adding followers to a single file or folder, or an option to embed a file to a website or a blog. While the detailed descriptions of the features were missing from the Cloud websites, it is impossible for the consumer to know what kind of capabilities are being included. Leaving things to 'be discovered' while using the product can have a negative effect on user experience especially when the desired feature appears insufficient or does not meet the requirements or expectations. Since some of the benchmarked Clouds had a distinctive features in them that would benefit certain user groups, disclosing these features in websites could play a major role when attracting new customers and when aiming for long term and permanent customer relationships.

4.3 ATTRAKDIFF EVALUATION

Although the benchmarking insights were reflected to the ones gained during the benchmarking- sessions held on F-Secure with the rest of the UX- team, not including the actual Cloud users would leave the results uncompleted and vague. For the purpose of this thesis conducting workshops to test various Cloud products to gain wider range of opinions and more detailed user experiences would have been justified. Nevertheless, due the lack of time to finish this thesis an Attrakdiff- method was used to gain a level of usability, user experience and appearance opinions of the selected Clouds from the user's perspective.

AttrakDiff is an online tool that facilitates anonymous evaluations of a chosen product. AttrakDiff evaluations distinguish between pragmatic and hedonic quality. Pragmatic factors are, for example, usefulness and usability. Hedonic factors include emotional needs, such as curiosity and identification. The resulting attractiveness is based on the combination of pragmatic and hedonic factors. (AttrakDiff 2013.)

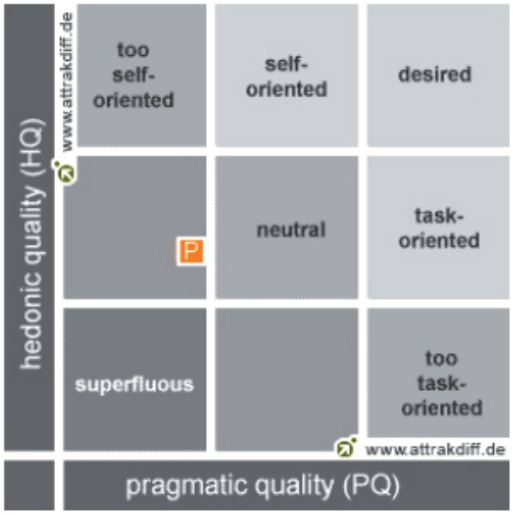


Figures 13-15. AttrakDiff evaluation pages 1-3.

To evaluate the user experience and attractiveness of the selected Cloud storages from user's perspective, an AttrakDiff- survey was created for each of the four Clouds being examined. For the evaluation to be successful, users of the selected Cloud storages needed to be found. To accomplish this, links to the evaluations were posted into the international user forums and discussion channels of each Cloud, together with a brief description about the nature of the evaluation. This method proved to be an effective way to find users who have been using the Cloud storage for some time and have already gained a level of experience and insights about the product. Each AttrakDiff-evaluation reached from 15 to 20 participants from all over the world.

Attrakdiff- results were then compared to the benchmarking- insights which resulted similarities between the real user experiences and phases of user interactions being examined. Thislife, providing a sufficient amount of versatile features, good usability and multiple ways to view content, received the best pragmatic classification and was considered "stimulative" based on AttrakDiff- evaluation results. On the other hand Mediafire which while being benchmarked had a complex user interface and occasionally unresponsive actions, was rated "superfluous" in terms of hedonic quality and very poorly in terms of pragmatic quality. Copy and Irista received moderate and neutral results from both AttrakDiff and benchmarking while Irista reaching only average values from pragmatic quality.

MEDIAFIRE: ATTRAKDIFF- RESULTS



INSIGHTS FROM BENCHMARKING:

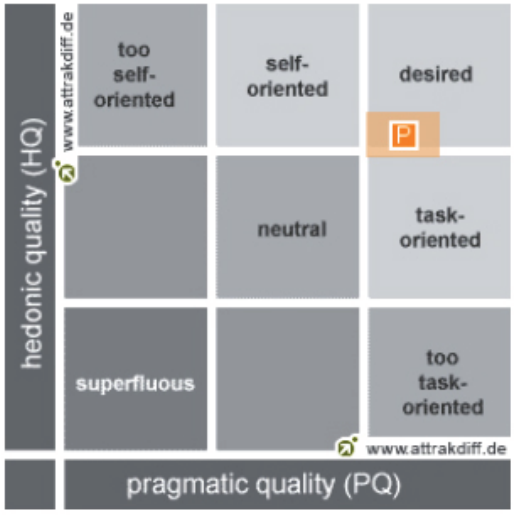
Informative website	moderate
Sharing options	good
User interface	confusing
Usability	slow, unresponsive
Feature selection	ok
Amount of accepted file types	excellent

IRISTA: ATTRAKDIFF- RESULTS

INSIGHTS FROM BENCHMARKING:

Informative website	no
Sharing options	poor
User interface	confusing
Usability	confusing at times
Feature selection	narrow
Amount of accepted file types	only photos

THISLIFE: ATTRAKDIFF- RESULTS



INSIGHTS FROM BENCHMARKING:

Informative website	yes
Sharing options	good
User interface	good
Usability	good
Feature selection	versatile
Amount of accepted file types	only photos and viceos

COPY: ATTRAKDIFF- RESULTS

INSIGHTS FROM BENCHMARKING:

Informative website	no
Sharing options	excellent
User interface	ok
Usability	ok
Feature selection	narrow
Amount of accepted file types	excellent

Figures 16-19. AttrakDiff- evaluations with benchmarking result comparison of each Cloud.

4.4 CLOUD USER SURVEY

A user research survey was used to map the opinions of people who are using any Cloud- based solution to store and backup their files, whether personal or work-related. Google Docs was used as a platform to proceed with the survey which was spread amongst art and design- students of Aalto University by email. Like AttrakDiff-questionnaire, the survey link was also placed to various forums and discussion channels focusing on Cloud storages. Facebook was also utilised to spread the link to the survey which altogether reached a number of 86 responses total. Majority of respondents were within the age group of 20-29 and 30-39 and using a Cloud storage mainly at home, at work and at school / while studying.

Questions in the survey varied from preferred Cloud storages to the most important and wanted features. The aim of the survey was to find out whether people who have chosen the Cloud storage based on what other people around them are using, are missing features that would make the service more suitable for their personal needs. The survey revealed a wide dispersion between desired features in which the most wanted were clearer file hierarchy, ability to restore previous versions of files after editing them locally, simple user interface, larger thumbnails for files, capability to organise files based on tags as well as unlimited file size for a single file. Since Cloud websites often lack sufficient amount of information about the included features of the product, finding a Cloud storage that contains desired features can be difficult for consumers.

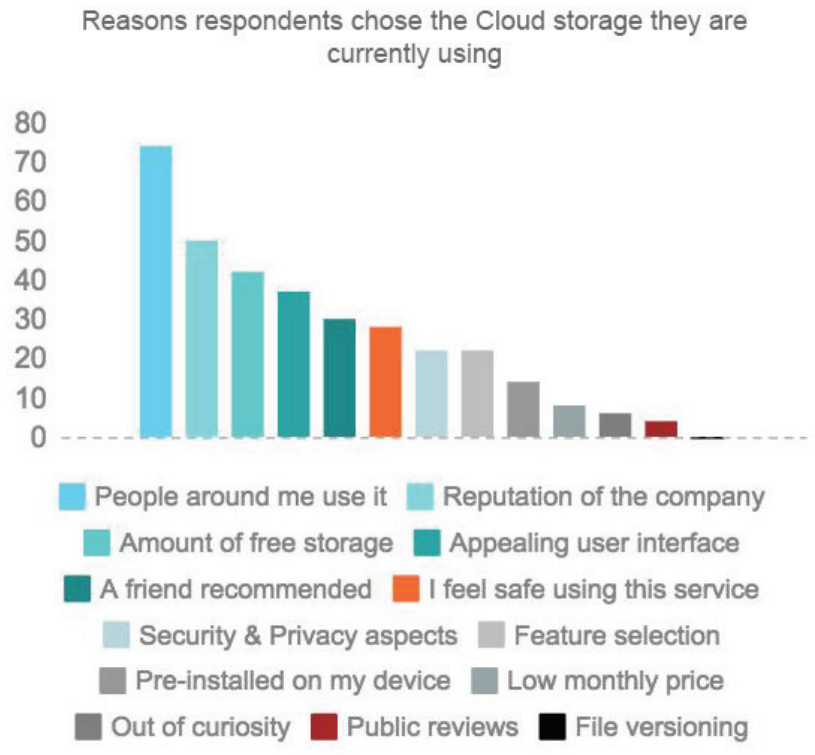


Figure 20. Survey results for the reasons to choose a Cloud storage.

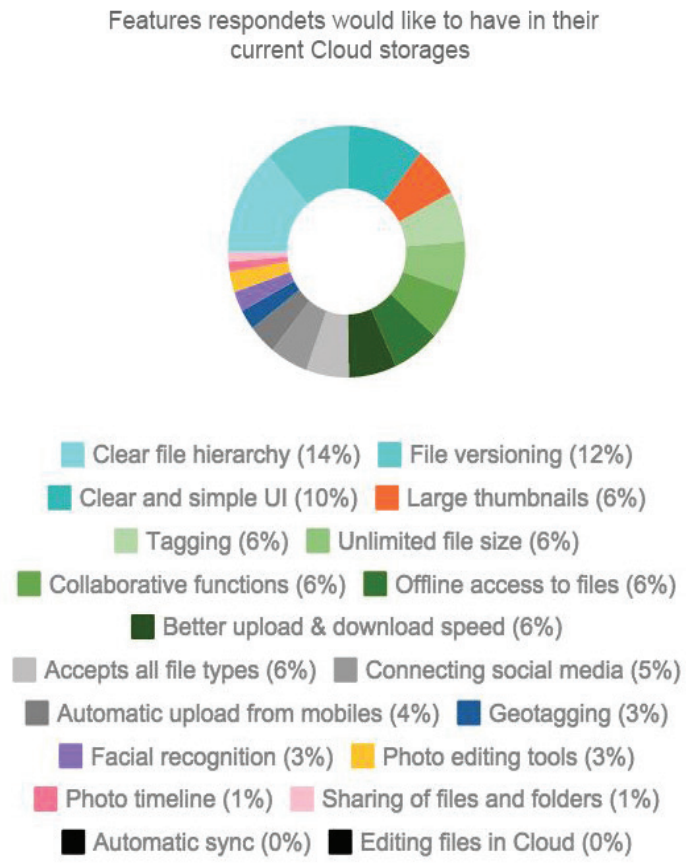


Figure 21. Survey results for the features that are missing from respondents Cloud storage.

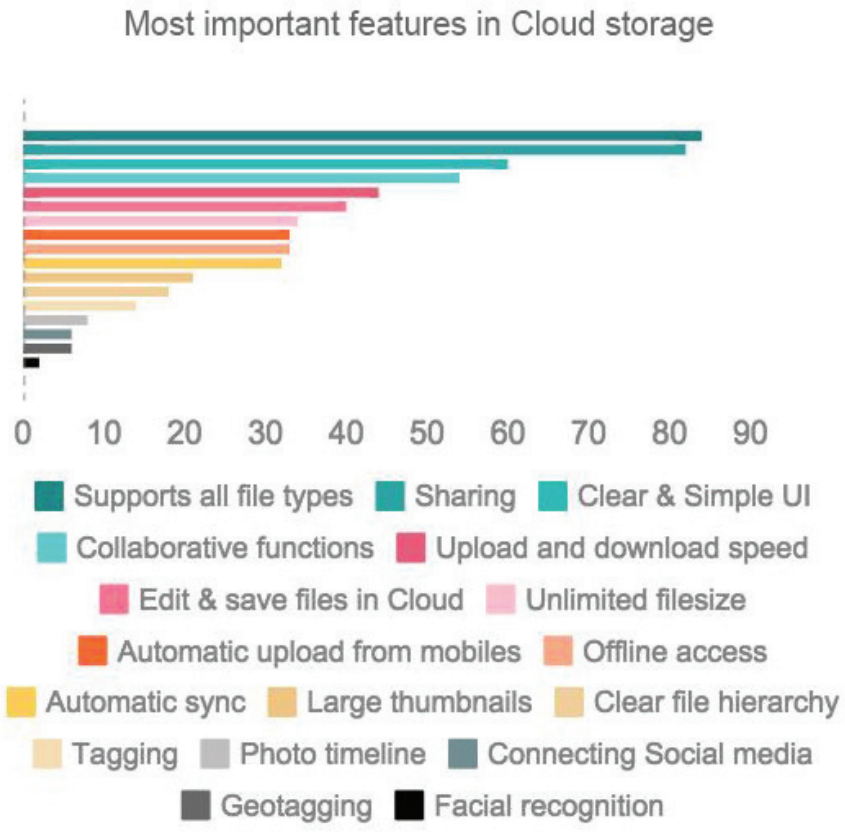


Figure 22. Survey results for the most important features in Cloud storage.

Based on the survey, the most important features in Cloud storages is the ability to store all sorts of file types and the capability to share files. Cloud should also have a clear and simple user interface as well as collaborative functions such as group spaces.

People were also asked about how often they change a Cloud storage. 20% of the respondents change the service once a year, 14% one to two times per year.

The survey also supports the statement made earlier that many Cloud storage users do not read the Privacy Policy- and Terms of Service agreements before accepting them. Still majority of the respondents were worried about the privacy and security aspects when storing files in a Cloud. Based on the survey results and insights gained during the background study, it can be stated that in order for consumers to feel more secure while using Cloud products, means to deliver the legal information in more effortless and understandable ways are needed.

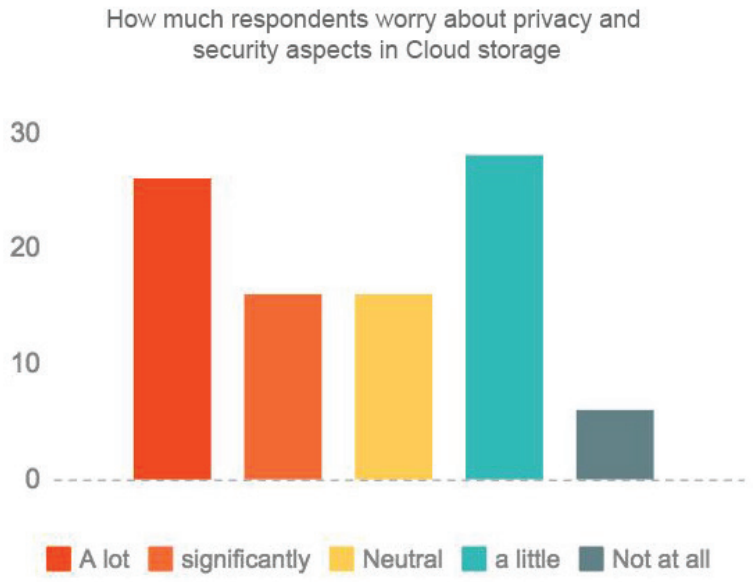


Figure 23. Survey results for the privacy and security concerns.

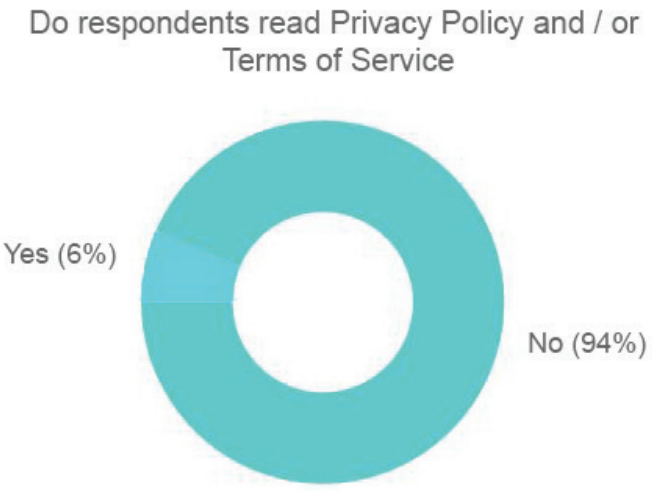


Figure 24. Survey results for whether the respondents familiarise with the legal documents.

4.5 UNSTRUCTURED INTERVIEWS

In addition to the online survey, during the spring semester 2015 short unstructured interviews were conducted amongst Aalto University students and personal friends who are using a Cloud storage on daily basis. The interviews supported the statement that although Cloud storages are nowadays widely adapted to transfer files from one place to another instead of USB- flash drives, the Cloud provider has been chosen based on other people around them and what they are using. In most of the cases when asked about different features, the current Cloud does not fully answer the demand user has but finding a service that would include the preferred features is not easy. What also became evident was that due the privacy violations that have been taking place amongst Cloud providers, trusting any Cloud storage has become difficult. Similar to survey respondents, the interviewees also struggled with the legalese that has been used in the Privacy Policy and Terms of Service contracts.

4.6 EXPERIENCE JOURNEY FRAMEWORK

To create a starting point for the concepting phase a Experience Journey Framework (Figure 24) was defined to determine the boundaries for the final concept. A model provided by Conifer Research (2002) was utilised for the purpose. The focus point was set to the familiarization phase of a new Cloud storage where user is searching for a suitable product amongst multiple service providers, possibly without any further knowledge about the possibilities and features that are available.

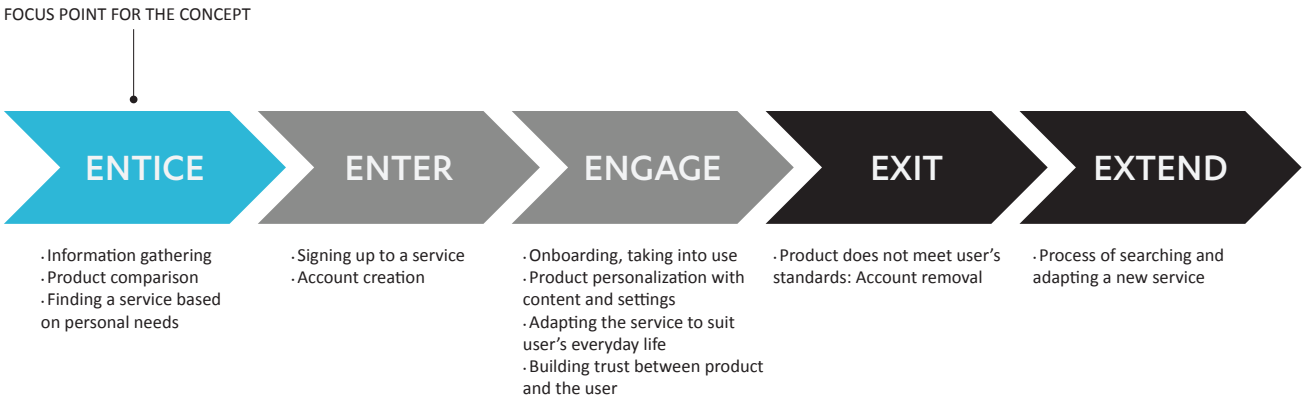


Figure 25: Experience Journey Framework based on Conifer Research (2002).

5 IDENTIFYING DESIGN CONCEPTS

With a support of the main finding discovered earlier, the ideation phase was commenced. In this chapter, the methods for concept creation and the outcome of the final concept are presented.

5.1 PERSONAS

To support the design process of a final concept, three personas were created based on research results gained earlier. Personas are user models that are represented as specific, individual human beings. Although not actual people, they are synthesized directly from observations, interviews and other research conducted with real people. Personas are an effective way to engage the empathy of the design and development towards the human target of the design. (Cooper & Reimann & Cronin 2007, 81.)

PERSONA 1: ERIKA NALIN, 20

Erika is a university student who is studying Environmental Biology as a major in Kuopio. She finds using a Cloud storage very useful while transferring study material between home and university. “I used to forget my notes at home but now I always have them with me”. As an active blogger Erika has two separate blogs which she updates several times per week. She stores most of her image and video material in Cloud to be able to update her blogs from anywhere, but sometimes struggles with limited file sizes and slow upload speed.

Apart from the Cloud storage used for blogs, Erika has created an account in two other Cloud storages to maximise the amount of free space and to combine different abilities from various services. One of these Clouds Erika uses to share photo galleries with her friends and family. “This Cloud has more attractive galleries that other services”. The third Cloud is used purely for collaborating with other university students during group assignments due the flexible group space features. Erika agrees that having a one Cloud to perform all tasks would be handy but has not been able to find a service that has all of the features she needs.

PERSONA 2: MIKKO HUTTUNEN, 33

Mikko is a busy entrepreneur who owns a small construction company in Tampere. He works as a manager for a team of four employees. Mikko uses a shared folder in a Cloud storage to store and share files with his co-workers, but feels uncertain about using Cloud to store confidential information. Familiarising with the Privacy Policy and Terms of Service- contracts feels too much of a burden. Mikko would be interested in trying a secure, trusted and fully encrypted Cloud storage based in Finland or elsewhere in Europe but has not found a suitable one yet. Mikko also thinks that having a possibility to create group spaces for easier file sharing and commenting would be a great feature in a Cloud

storage, and something that his company would benefit from.

While also being a husband, and a father of two children, Mikko sometimes worries about a sudden hard drive failure of his home computer where he has stored most of the family photos and memories. “If I knew that I could trust a Cloud storage, having automatic backup functionality to safely store my photos and videos would make me feel more secure”.

PERSONA 3: KENZO TAKADA, 30

Kenzo works as a freelance graphic designer for a medium sized design office in central Helsinki. He often goes to meet his clients to show his work from his laptop and he likes to use Cloud storage as a platform to store and present his visualizations.

Instead of having a website as a personal portfolio, he considers Cloud to be more flexible and faster to update. In order to meet his requirements, the Cloud needs to have a simple and minimalistic user interface that does not interfere with the visual content, as well as large thumbnails for individual files to better bring his work upfront when presenting.

Kenzo’s work also includes creating graphics for video projects. The Cloud storage he currently uses only supports photo formats and he is now searching for a service that would also allow video uploads and large file sizes. He would also like to use tags to organize his work based on used tools and work themes but has not yet found a Cloud that offers such feature.

While the Cloud storage that Kenzo has chosen only supports sharing through social media accounts, Kenzo sometimes struggles with sending large files as an email attachments to his friends and colleagues.

5.2 CONCEPT IDEATION

Through personas the preliminary problem with Cloud storages was addressed. While each of the personas have different requirements to view and store files, finding a Cloud that has the features for one’s individual needs can be difficult. Combining the benchmarking analysis with the identified personas a preliminary idea of a final concept was formulated. The survey results as well as the interviews and discussions with the Cloud users helped to recognise a need for an impartial service, that would guide users with the selection of a Cloud storage and to more easily find new services

with fresh and innovative features.

From this stage, an idea of a web- based portal that would make it possible for users to search a suitable Cloud storage for themselves was formed. With support of the main findings addressed earlier, the general requirements for the concept were set as following:

ONLINE APPLICATION /SERVICE

Due the nature of Cloud storages the service should be accessible online in a form of a website or online application / portal. A multi-device support should also be guaranteed in order for users who are using Cloud storages mainly from mobile devices to be able to access the service.

BUSINESS MODEL

The core idea of the service would be the ability to search Cloud storages based on included features and purpose of use. After selecting from a set of predefined parameters, the service would suggest services that match the user's requirements and personal likings. To ensure that the application presents accurate search results and includes a versatile selection of both existing and new Cloud storages, the service should be offered and advertised towards Cloud companies for them to add their products into the service. The companies would benefit from the service in form of increased visibility and new customers for a reasonable price.

PRIVACY POLICY AND END USER LICENSE AGREEMENT

In addition to feature selections, consumers should be able to search for a Cloud storage based on the content of privacy policy and End User License Agreement- contracts. Due the extensive amount of legal content of these documents, the search would come up with the results of a limited but essential terms that determine how the uploaded content as well as user's personal data are being handled.

PRODUCT SCREENSHOTS

The service should include screenshots of the actual product which have been taken after the login- flow has been completed. This way the user able to preview how the client looks like and how the files appear in the service without needing to create an account first.

COMMENTING AND RATING THE SERVICES

In addition of searching suitable features, having the possibility to view other users experiences and ratings could give a valuable information about the advantages and disadvantages of the services in general.

6 FINAL CONCEPT

6.1 WIREFRAMES

After reviewing a list of requirements for the service, the features were turned into line drawings by using a wireframing technique. Wireframes are widely used amongst user interface designers as an important step of a screen design progress. By using wireframes, designers are able to concentrate on the layout without being distracted by colors, images, fonts or copy texts, as well as to plan the interactions of an interface. Wireframes are also commonly used to test the design amongst users and updating the design based on feedback, before the actual programming and visualization phase.

When using appropriate tools, wireframes can also include interactive elements to further enhance the user experience of the presented design. Because of the lack of time, a static wireframes were created for the purpose of this thesis to present the main functionalities of the concept. In the next paragraphs a landing page, customizable search function as well as search results will be presented.

In order for the service to be accessible for everyone, designing an online web-based service was a clear goal from the beginning. Due to the nature of the service, designing an online portal instead of a regular website felt natural. A web portals are organised gateways that structure the information available on the Internet. Compared to a regular search engine, portals often include customizable access to data which allows user to configure what kind of information is being displayed. (Cooper et al. 2007, 177).

Due to time limitations, the means for Cloud companies to add their service into the portal has not been further addressed in this thesis. Preliminary idea for this action included an additional page where general information as well as individual features could be added, as well as screenshots of different views of the service. Furthermore, designing the business model to appear more tempting for Cloud businesses of all sizes leaves a space for further research.

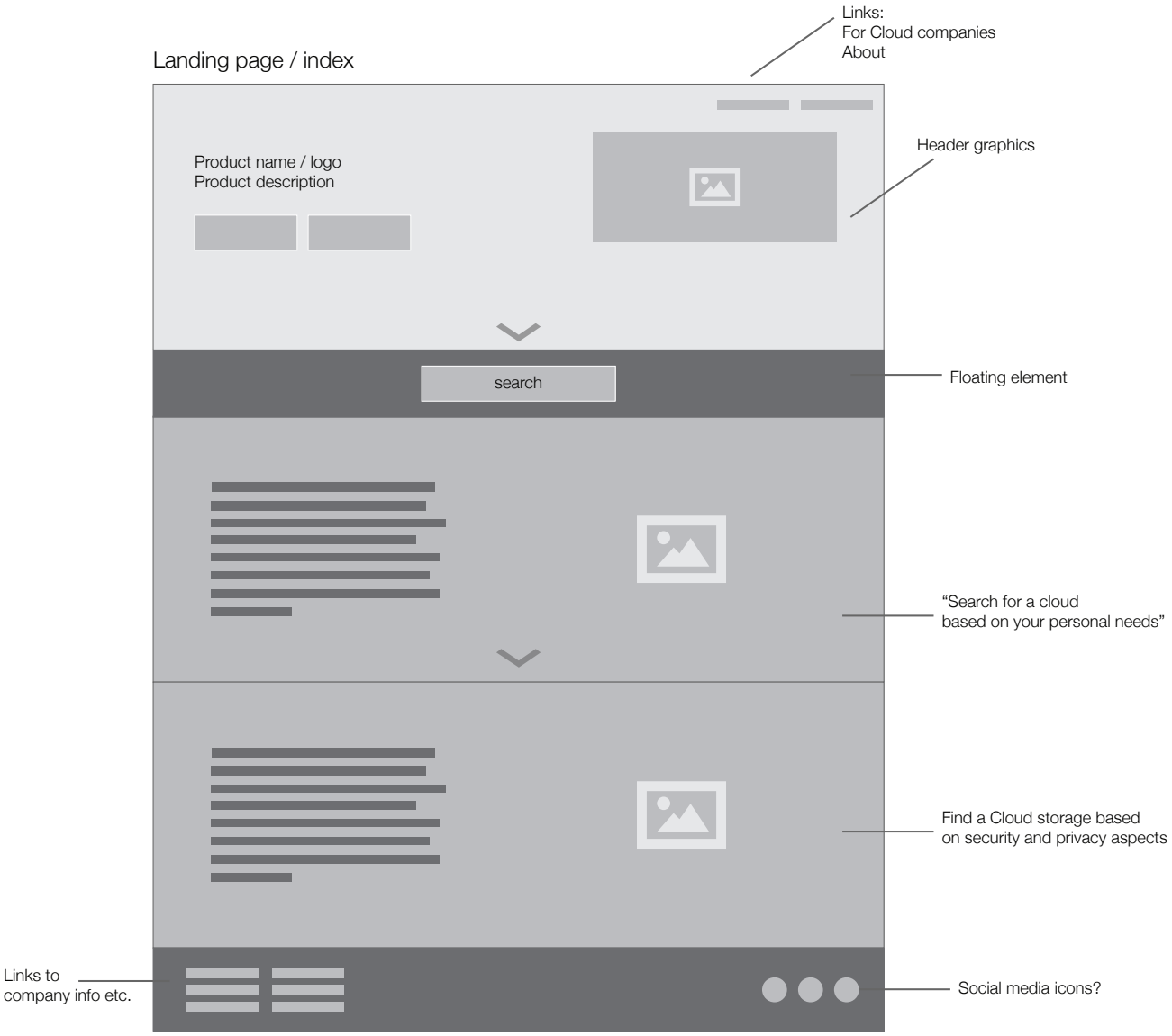


Figure 26: Wireframe for the landing view / index page.

LANDING PAGE

When user lands to the main page of the service, a general introduction of the service is presented. While the idea of a search engine purely for Cloud storages may seem technical for some of the users, the goal was to keep the user interface as clear and simple as possible to make it more accessible for everyone.

In order for the portal to work also on mobile devices as well as different screen resolutions, responsive design principles were followed throughout the design progress.

CUSTOMIZABLE SEARCH

Online Portals, together with online stores, banks and real estate search engines such as etuovi.com, belong to the group of transactional sites. What is common to transactional sites is that they have a significant information aspect. For these types

of sites, navigational clarity is very important, as are access to supporting information and efficient transactions. (Cooper et al. 2007, 177). According to Cooper et al. (2007, 177) when designing transactional sites, paying attention to navigational aspects is important in order to maintain a good user experience. While working with a portal that contains customizable search options, it may be tempting to break up information and functions to several pages to reduce the loading time and visual complexity. Users should not be forced to navigate between different views more than necessary. Also the potential for confusion and click fatigue, as well as excessive loading times with heavy websites is is good to take into consideration.

To minimise the navigation between different views and to maintain user's interest while using the search function, a decision was made to keep the search parameters on a single page and divide them into categories by using Accordion Panels. Accordion panels are a vertically stacked menu items such as links or thumbnails, that can be individually expanded by a single mouse click to reveal more content associated with them. Accordion Panels are used by user interface designers to reduce the information overload by showing only a portion of a content at once, as well as to maintain the vertical length of a web site or view of an application.

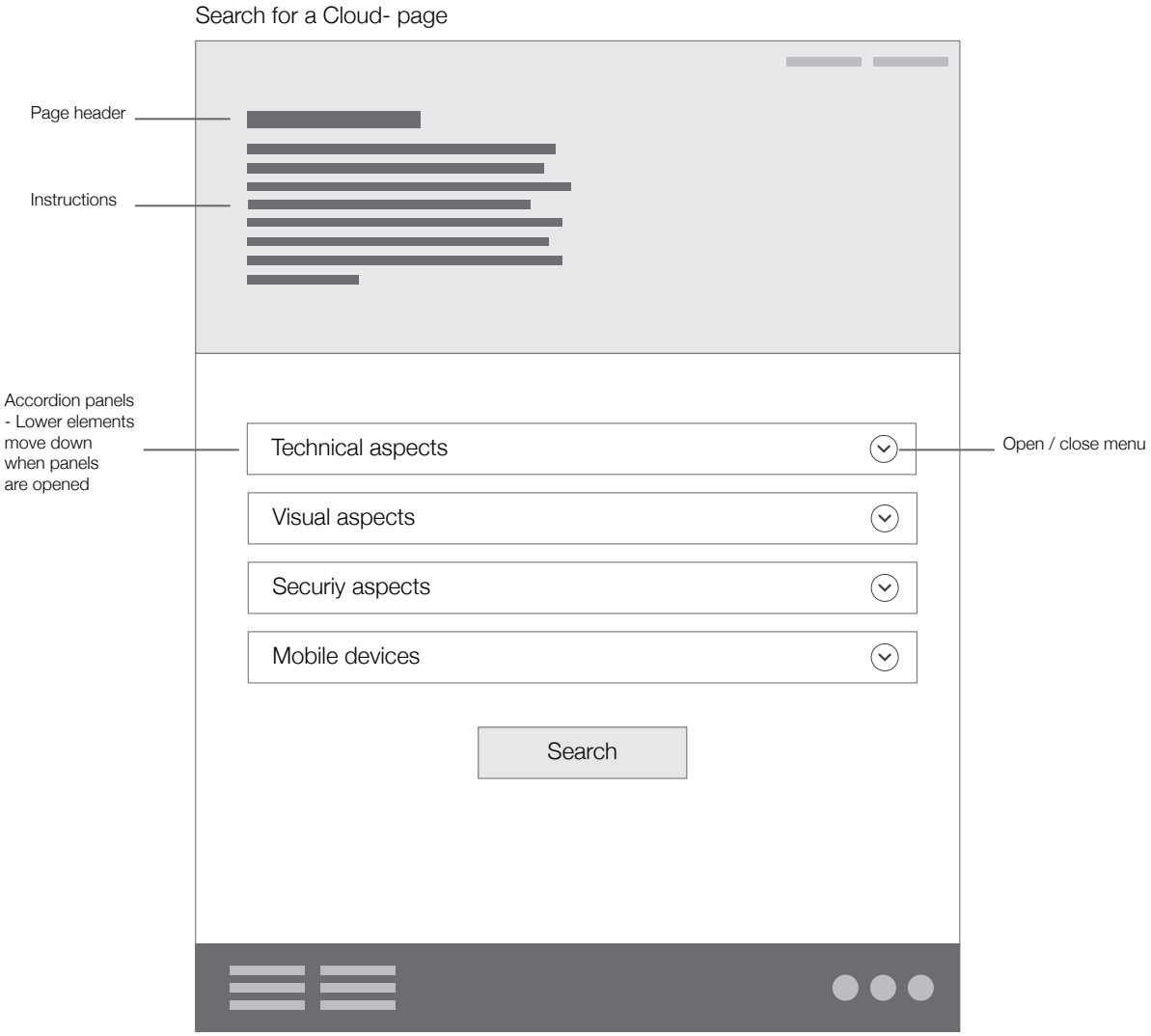


Figure 27: Wireframe for the search page when the panels are closed.

Since the search would be done based on included features of Cloud storages, the features were organised as feature groups and panels were then named accordingly. A groups for technical, visual and security aspects were created, as well as for features that are related to mobile platforms:

TECHNICAL ASPECTS:

Possibility to share files through social media services
Possibility to upload content from social media services
Accept all file types
File versioning
Tagging of files
Geotagging
Photo timeline
Unlimited file size
Group spaces / collaborative functions
Automatic uploads from defined folders from OS
Offline access to Files

VISUAL ASPECTS:

Dark user- interface
Light user- interface
Thumbnails / preview images for uploaded files
Large thumbnails for photos
File editing tools

SECURITY ASPECTS:

Personal information will not be sold to third parties
Personal information will not be used for advertising
Contact information will not be used for advertising
Contact information will not be shared with third parties
Rights to the uploaded content remains with user
Service provider will not gain access to the uploaded content
Password protection for shared files
A link to the shared file can be terminated by user
Possibility to export all data after deleting an account
Possibility to delete the account and user data
Encrypted storage
Encrypted file transfer

MOBILE DEVICES:

Application for Android devices
Application for iOS- devices
Application for Windows Phone
Auto- upload from mobile devices

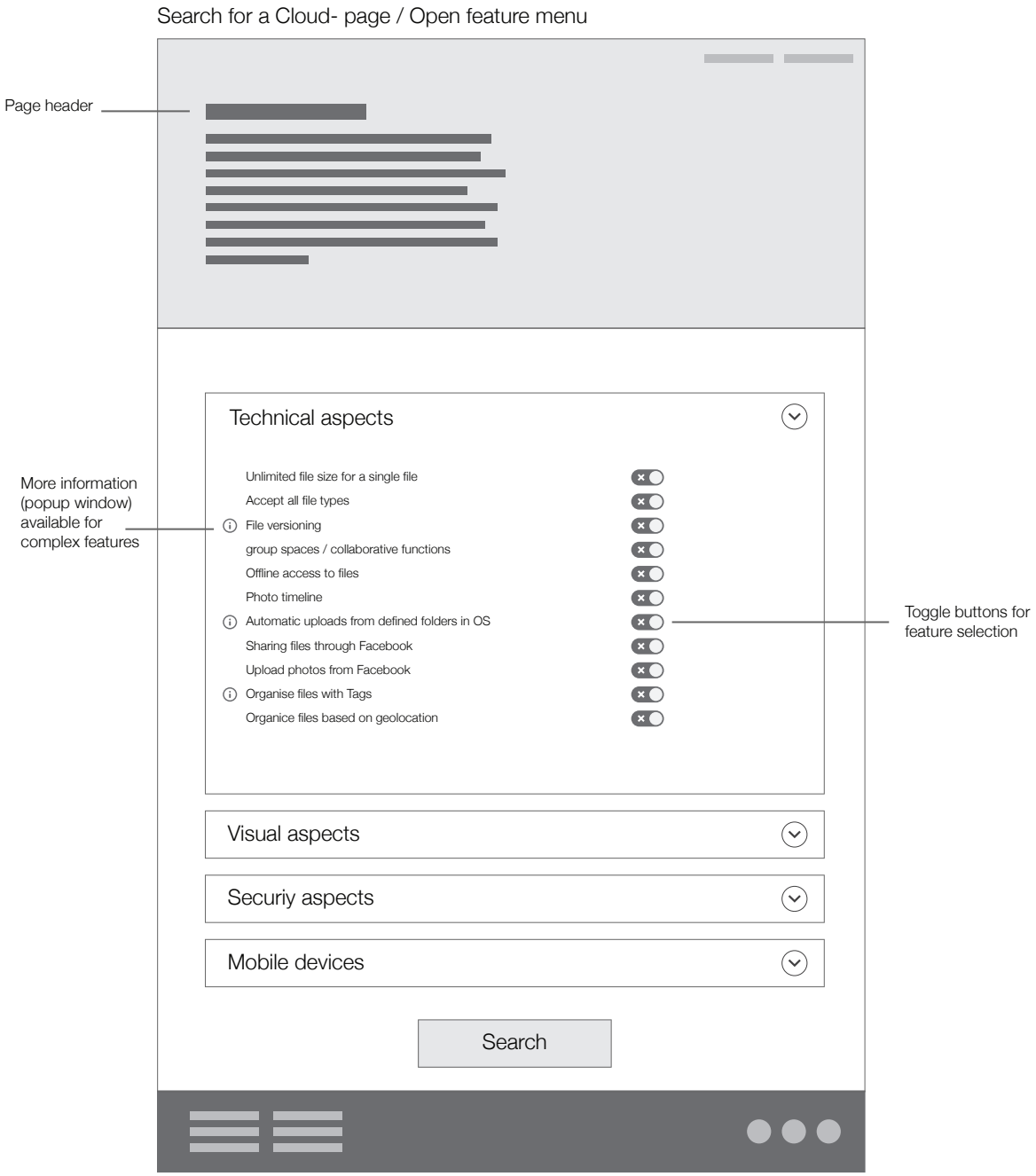


Figure 28: Wireframe for the search page when one of the panels is open.

When a feature panel has been opened, user would be able to select the features that matter most by clicking the button icons next to each feature. When a panel is closed and a next panel being opened, the previously selected features are saved until the search is being performed. In case user is uncertain about a feature or the terminology that has been used to describe a feature, more information can be viewed when Info-icon is being clicked. Clicking the icon would then launch a popup- window on top of the search view, allowing user to stay on the site while while reading a more detailed feature description.

Figure 29: Wireframe for the search results page.

SEARCH RESULTS

Based on the inserted parameters, the search would then display a list of suitable Cloud storages in an order of most suitable to least suitable. A link to the service provider’s site as well as screenshots of the product would be displayed. Similar to categories that were used on the search- view, the results would also be sorted as technical, visual, security and mobile device- related aspects. The search would only display features that match the search criterias set by the user. In case none of the search criterias are found in a certain category, a small notification would be displayed.

6.2 HIGH FIDELITY VISUALIZATIONS

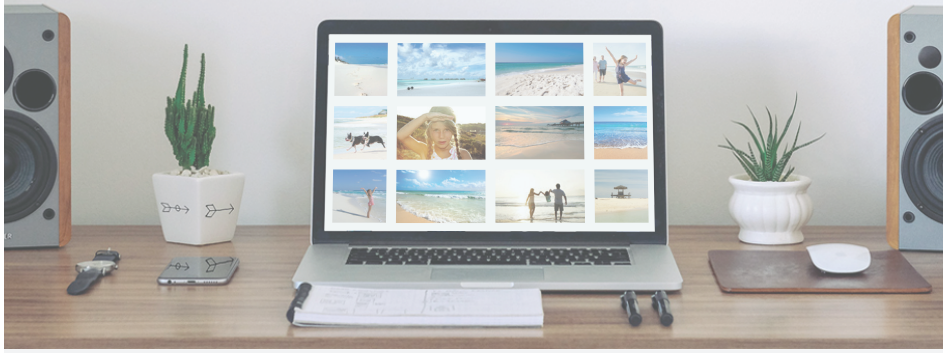
Figure 30: Visualization of the final concept “CloudSearch” on a desktop- and mobile device.

For Cloud Companies About

CloudSearch

Discover the perfect Cloud storage for your personal needs.

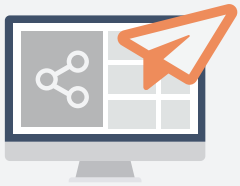
BEGIN TO SEARCH



Find a Cloud Storage based on included features

CloudSearch makes it possible for you to search a Cloud Storage for your photos, videos and other documents based on the features you value most.

Whether you are looking for a Cooud Storage based on appealing User Interface and large thumbnails..



Flexible sharing options such as sharing files with a password protection, public link, through social media or by creating group spaces..

Or versatile ways to organice files by using folders, tags, geolocations, events or facial recognition..

CloudSearch will find a perfect Cloud Storage for you!

BEGIN THE CLOUD STORAGE SEARCH

Find a Cloud Storage based on security and privacy

Worried about the privacy and safety aspects when using a Cloud Storage? CloudSearch helps you to examine the legalese in Privacy Policy and Terms of Service-documents based on your personal criteria.

BEGIN THE CLOUD STORAGE SEARCH

About
For Cloud companies

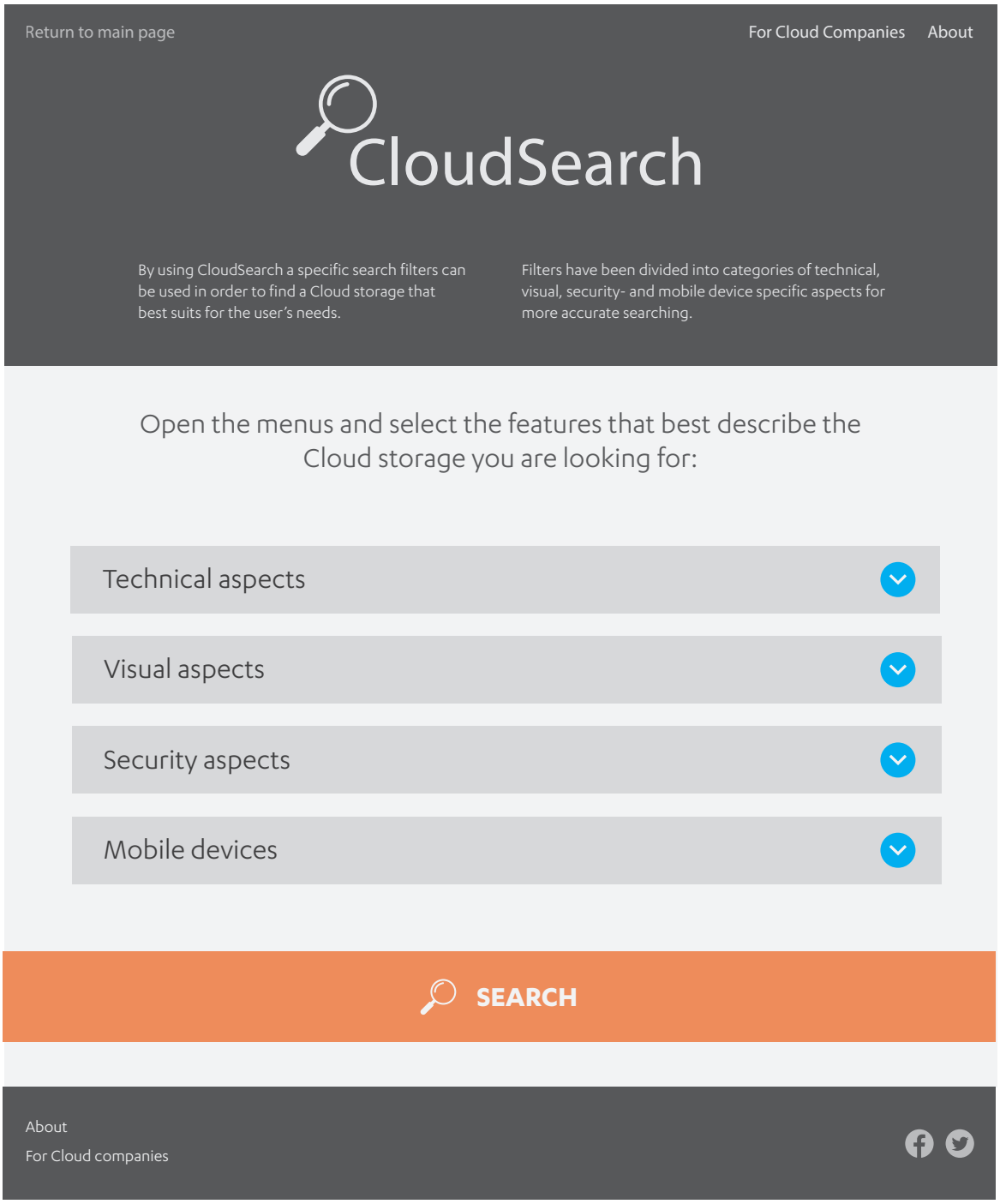


Figure 31: The complete visual layout of the landing page. While the service is mainly targeted for general consumers, the aim was to keep the look and feel of the site uncluttered with information and not looking so technical- oriented.

Figure 32: Visualization of the Search-page.

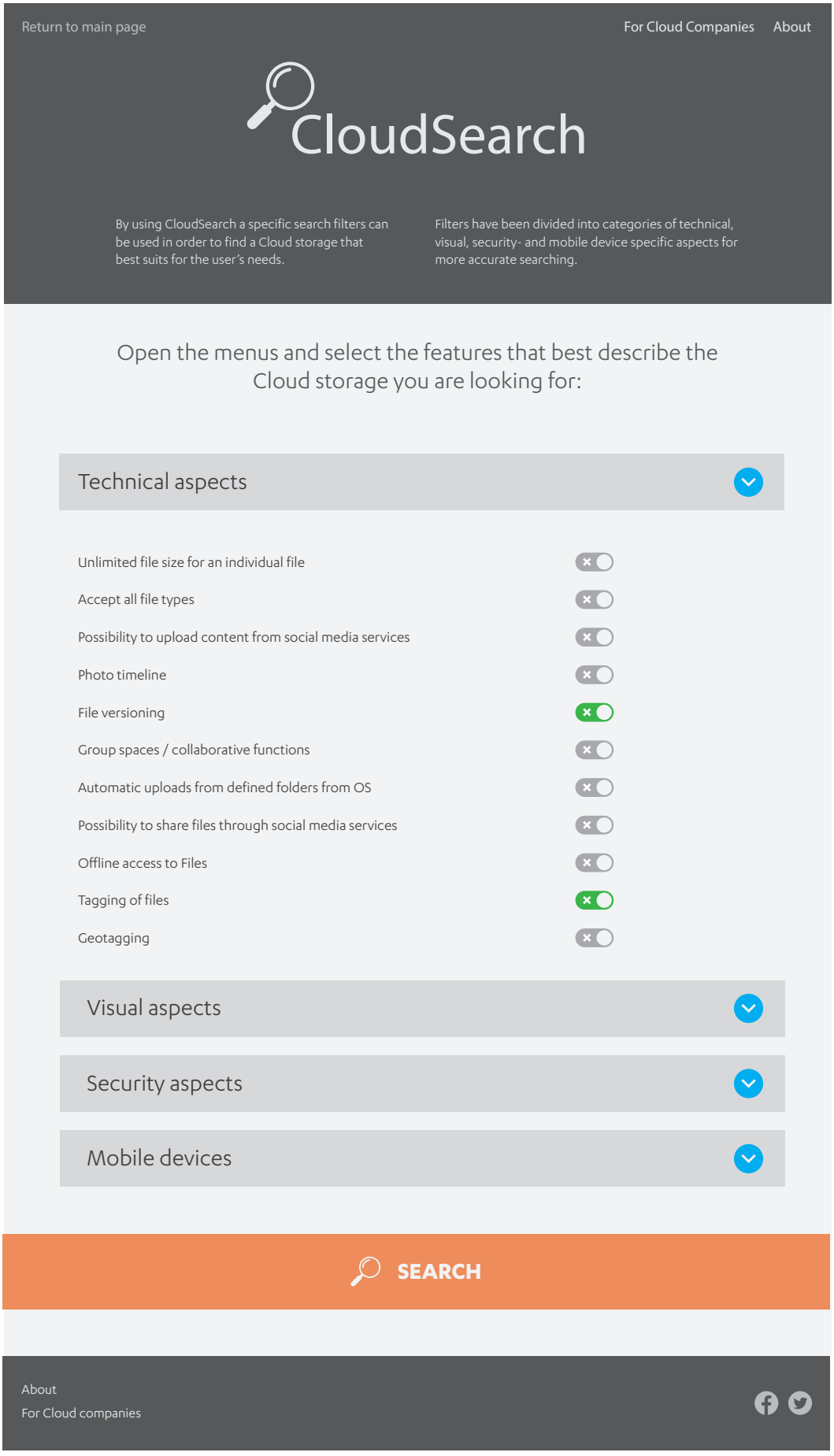


Figure 33: Layout for the Search- page when one of the panels is open.

Return to main page

For Cloud Companies About

CloudSearch

RETURN TO SEARCH

Search results:

Best results

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Copy

https://www.copy.com

TECHNICAL ASPECTS:

+ Unlimited file size for a single file
+ Accepts all file types
+ File versioning

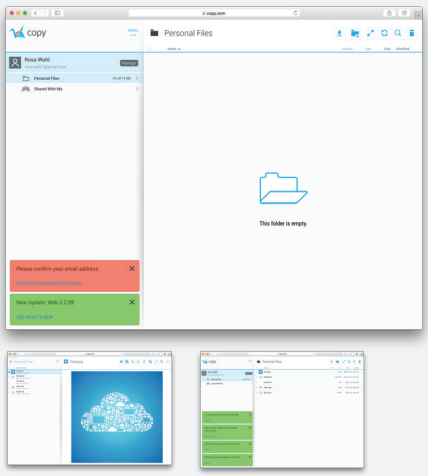
VISUAL ASPECTS:

+ Light user- interaface

SECURITY ASPECTS:

+ Encrypted storage
+ Possibility to delete the account and user data

Link to the Privacy Policy:
https://www.copy.com/page/privacy



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MediaFire

https://www.mediafire.com

TECHNICAL ASPECTS:

+ File versioning
+ Accepts all file types
+ Possibility to share files through social media services

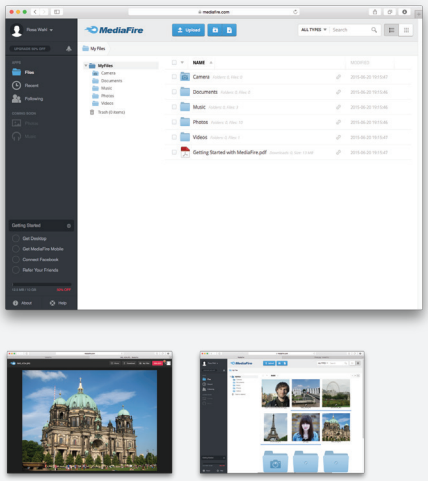
VISUAL ASPECTS:

+ Light user- interaface
+ Large thumbnails

SECURITY ASPECTS:

No results to match your search

Link to the Privacy Policy:
https://www.mediafire.com/policies/privacy_policy



About

For Cloud companies

Figure 34: Layout for the Search Results- page showing two results.

6.3 FURTHER CONCEPT DEVELOPMENT

Due the time limitations to finish this thesis the final concept development as well as the evaluation phase was being left incomplete. The natural next step for the concept development would have included a several rounds of user testing sessions in order to be able validate the both the interaction- and user interface decisions as well general usability. Also, as mentioned earlier, in order for the service to be fully beneficial, attaining the interest of a Cloud storage providers would be essential. To achieve this a further development of the concept and the business model would be required. The list of features to be searched should be validated together with Cloud companies, as well as Cloud experts and general consumers, in order to succeed with a service that fulfills the needs of all involved parties.

To further develop the search functionality, an option to search a Cloud based on product or company name could be included in order for consumers to seek specific and detailed information about a certain Cloud storage. Also a feature that is worth to consider would be a possibility to search and compare multiple Cloud storages at once. This feature could be beneficial in case the user has grown interest towards certain Clouds but feels uncertain about the security aspects or the full set of features that are included in the services.

6.4 CONCLUSIONS

In this thesis I explored the area of Cloud storages, different deployment models and ways to implement a Cloud and eventually the benefits and challenges included in the use of a personal Cloud. The ultimate goal of this thesis was to discover means to ease up the selection process of a Cloud storage for consumers. Research was carried on from the point of user experience design to the point were a selection of Cloud storages were benchmarked in order to find common factors that affect the general user experience while using a Cloud storage. These findings together with the previous expertise gained while working in the area of Cloud computing were used to design the final concept for this thesis. The final concept consists of a web- based service called CloudSearch which can be used as a platform when a selection of Cloud storages are being search and compared. In addition of displaying included features and technical implementations, CloudSearch addresses the content of legal Privacy Policy and EULA-documents in order to make their content more understandable for consumers.

This research addresses several questions and design challenges for further investigation. While Cloud is an efficient tool for handling large amounts of data from multiple devices, information security issues are still holding back the adoption of Cloud storages by individuals. During the research phase it became evident that one of the key issues to improve the trust between a Cloud company and customer is transparency. Information about how the data is being handled, what kind of security measurements are being used in case of a sudden server failure can play a major role for the user. Who has access to users personal data and how are the copyright issues being handled are few of the legal agreements included in the Privacy Policy and Terms of Service- contracts, lengthy documents that are written in legalese difficult for consumers to understand. In order for the personal Cloud storages to be fully adapted by regular consumers, finding means to ease up the information sharing between the Cloud companies and consumers are needed.

Other topics that arose while exploring the topic were related to the meaning of privacy in general. In a world where sharing personal photographs and videos in public domains has become almost an everyday habit for younger generation, how are the privacy issues encompassed in future? Is the true meaning of privacy weakened amongst young active social media users who do not consider privacy the same way as the older generation does?

6.5 PERSONAL REFLECTION

During the process of making this thesis challenges were met regarding of the selection of the final topic. First starting as part product development process for F-Secure, the direction of the topic shifted due organizational changes that took place in the company. After deciding to focus on benchmarking Cloud storages, I was no longer working for the company which affected greatly to the intended process of finalizing the thesis.

Being able to proceed with the topic behind schedule caused the final concept to be left partly incomplete due the lack of time to perform iterations with the wireframes and evaluating the concept with experts and end- users.

Nevertheless, I'm pleased of the research process that eventually led to the concept ideation. Familiarizing with the literature and existing research about the area of Cloud storage provided me a great amount of information and insights that are going to be useful in my future work as a user interface designer. Overall I found this thesis project to be a valuable learning process that has taught me a lot about the challenges and advantages of Cloud storages and the opportunities that lie for designers in the area of Cloud computing.

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Other images created by Rosa Wahl

APPENDIX

1. Benchmarking

COPY

Specifications	
Product name	Copy
Service provider	Barracuda Networks
Operating systems	Mac, Windows, Linux, iOS, Android, Windows Phone
Available apps	Web, desktop, mobile
Location of the data centers	USA
Features	
Free trial	√
Free online storage	15 GB
Maximum file size limit	None
Accepts various file types	√
Folders and nested folders	√
File versioning	√
File sharing	√
Adjustable time limit on shares	X
File import from other Cloud Storages	√
Photo Import from Social Media services	X
Collaborative functions / group spaces	X
File editing tools	X
Facial recognition	X
Tagging	X
Geotagging	X
UI theme color	Light
Large thumbnails for photos	X
Advertisement inside application	X
Security	
Requires the EULA acceptance before trying out the product	√

User's personal information will be shared with third parties	√
User's personal information will be used for advertising	√
Encrypted Storage	√
Encrypted Transfer	√
Possibility to delete the account and user data	√
Export all data after deleting an account	X

Website

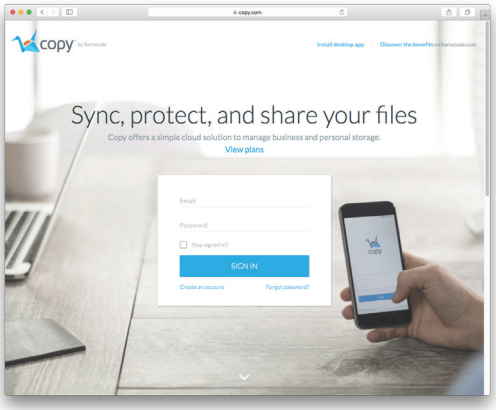


Figure 1. Copy website.

The first impression of the Copy website is fresh, simple and minimalistic. The main go to- action is the sign In- window for existing users, from which new users can also create an account. In addition to the web application also a desktop- application can be downloaded from the top right corner of the site. The lower part of the site presents the available plans that consists of the 'Basic', 'Pro' and 'Copy for Companies' plans. Basic- plan is free and it comes with a 15GB of Cloud space. Other plans come with a upgradeable monthly fee starting from $4.99 per month. For the purpose of this thesis only the free Basic- plan of the web application will be examined.

The Copy website gives a very little information about the actual product for the consumers. Only a handful of the available features are listed without further descriptions of how these features have been implemented and how the consumers who are new with Clouds can benefit from them. Why the consumer should choose Copy over other Cloud providers has not been presented on the site.

Screenshots and images of the actual product are missing and to get familiar with the look and feel of the application, installation of the actual application is required.

Account creation

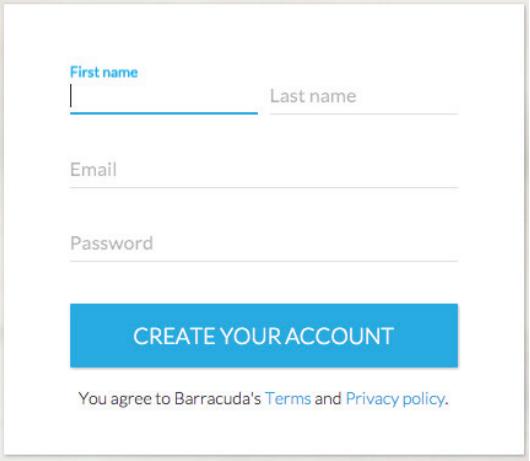


Figure 2. Account creation view.

An account creation is needed to be able to try and use Copy. During account creation a full name and email address are requested and in order to proceed, all of the fields need to be filled.

Privacy Policy / Terms of Service

While creating an account user will automatically agree to the Terms of Service and Privacy Policy of a Barracuda Networks. Links to these documents are very small and can easily be missed and ignored by user. Examining both documents more closely reveals that by creating an account and using Copy, a permission to access user's personal information is granted for the Barracuda Networks and third parties assisting the company in marketing. The personal information being collected includes name, picture, email address, user-names, passwords, phone numbers, postal addresses and location information and contacts and calendar information. In case the user shares, sends or receives content through Copy, other people's personal information will also be provided to Barracuda Networks. Terms of Service document also state that Copy reserves the right at any time to modify the Terms and agreements with or without notice and without any liability to users. By accepting the Terms user's agree to be bound by the agreements as modified.

While the personal information is used and shared by Barracuda Networks and associated companies for marketing and other purposes, the documents state that the files stored in Copy will remain private. Nevertheless the company may access file specific information such as thumbnails, sizes and file extensions for system maintenance and management purposes and during technical support.

Taking into Use

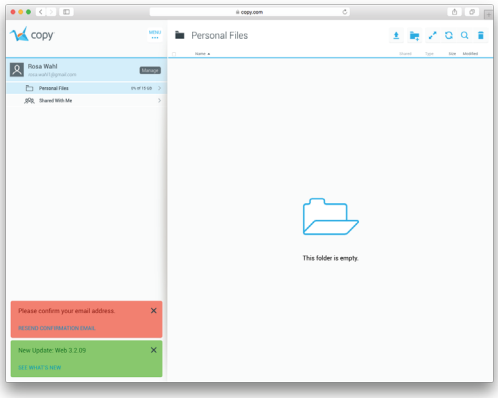
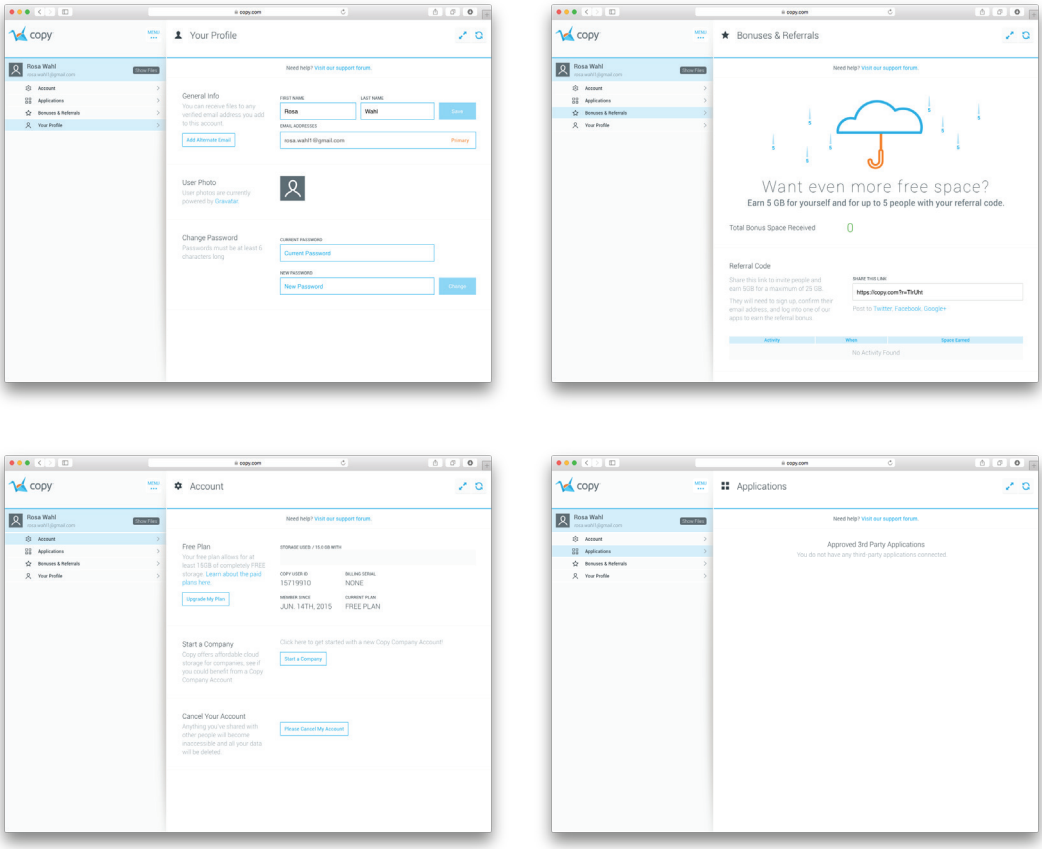


Figure 3. Landing view after login. Red popup window requests confirmation of the email address and green popup informs about new updates.

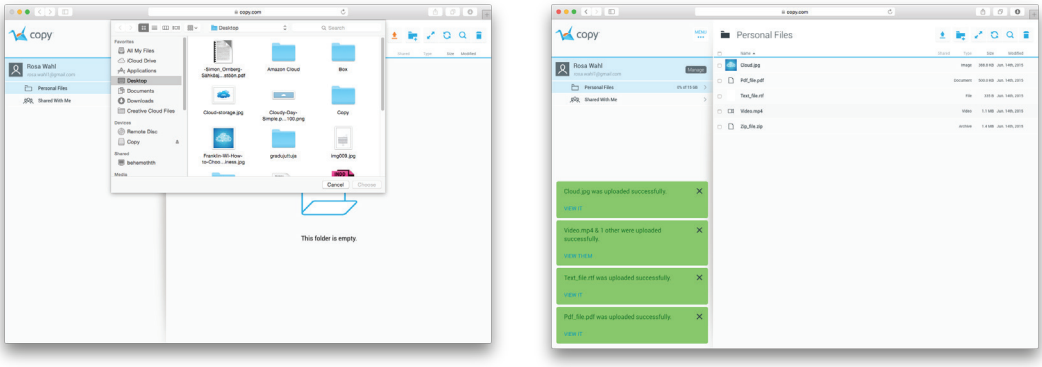
After login, the user lands into a view with a side panel on the left side and a content area telling that no files have been added yet. Features such as onboarding wizard and contextual instructions such as tooltips are missing completely and user is left alone to discover the user interface and main functions by himself.

At first glance the user interface seems minimalistic and light, main UI- colors being light grey and blue. Functions for user to **upload files, create a folder, enter a full screen view, search** and **delete files** are located on the top right corner of the UI. On the top right corner a popup menu holds functions such as **Invite to Copy** that allows user to increase the free storage space with 5 GB (up to 25GB) by recommending Copy to new users. The menu also holds a **Help**- function which transfers user to an online support forum and a function called **Transfer a Service** that makes it possible for user to transfer files from other existing Cloud Storages (Dropbox, Google Drive and Box) into Copy. This function is free for up to 2 GB of data being transferred. Other functions included in the top right menu are **Create a Company Account** and **Sign Out**. Create a Company Account makes it possible for users to set up a 30 day free trial for a business account before purchasing the full feature. To maintain the scope of the thesis to focus on products targeted for general consumers, the process of creating a company account is left out from this research.
The account preferences and personal information can be modified through the left side menu. On Your Profile section user is able to add a user photo, change password and add alternative email address. On Account- section user can view the amount of space that has been used and how much space is still left, and also upgrade the free plan to paid plan to increase the amount of storage.



Figures 4-7. Profile and account information views. Bonuses & Referrals- view shows the amount of bonus space that has been earned by inviting people to use Copy. In case user has connected approved third-party applications to Copy, those can be viewed in the Applications- view. The fact that the list of available applications is not visible in the application or in the Copy website can make this view confusing and useless for the user.

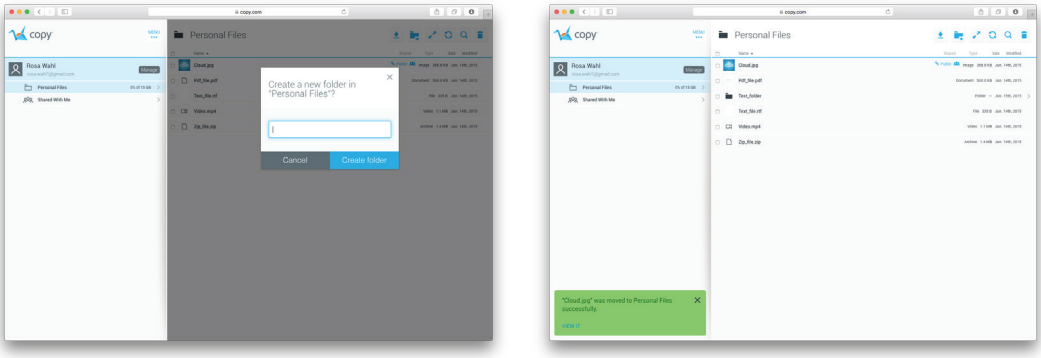
Adding Files and Folders



Figures 8-9. File upload.

Pressing the Upload- icon on top right menu opened a regular popup window from the OS- side for the file selection. A handful of the most commonly used file types such as JPEG, MP4, PDF, ZIP and RTF were uploaded successfully to the service. Files were displayed as a listview with an icons indicating the file type in question. Only a JPEG-file had a preview thumbnail of the content. Other visible file specific information were

filename, file size and the date the file has been added to the service. For users to view content only through a listview without larger thumbnails of the content can be laborious especially when searching for a specific file.



Figures 10-11. Creating a folder.

From the top menu user is able to add a folder with a specific name. When created, folder appears in the list view, together with a black folder icon, in an alphabetic order with the rest of the files. Files can be added to the folder by Drag & Drop. No preview of the content is displayed on the folder icon.

File- Specific Actions

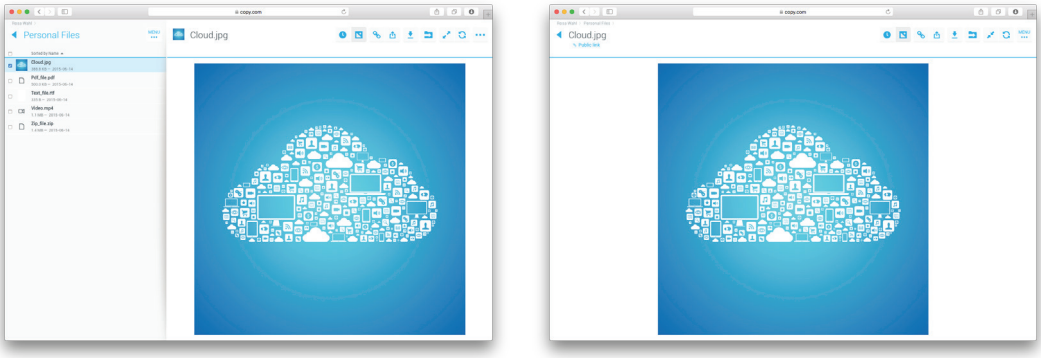


Figure 12-13. One file view and full screen view.

Double clicking a single file opened a one file view with an action panel on top. Other uploaded files appeared on the left side panel for easy browsing. Through the action panel user is offered a possibility to Rename, Download, Enter Fullscreen and Delete a file as well as Move the file to a different location (such as another folder) inside the Cloud. In case the user has installed a desktop application and editing a file locally, the File History- function makes it possible to return to the previous versions of the file.

What was put on mark during the testing was that after viewing a fle in full screen mode, the left side panel disappeared completely and remained closed after returning to the list view. A way to re-open the side panel was not discovered despite several attempts.

In one file view, user is able to share the file by Copy a Public Link- function that makes it possible for anyone accessing the link to view the file. The link can be disconnected at any time by the user. Through Share- function user is also able to share the file or a folder to specific people via email, together with a message. Rights for the recipients to view, download and share the file forward can also be modified.

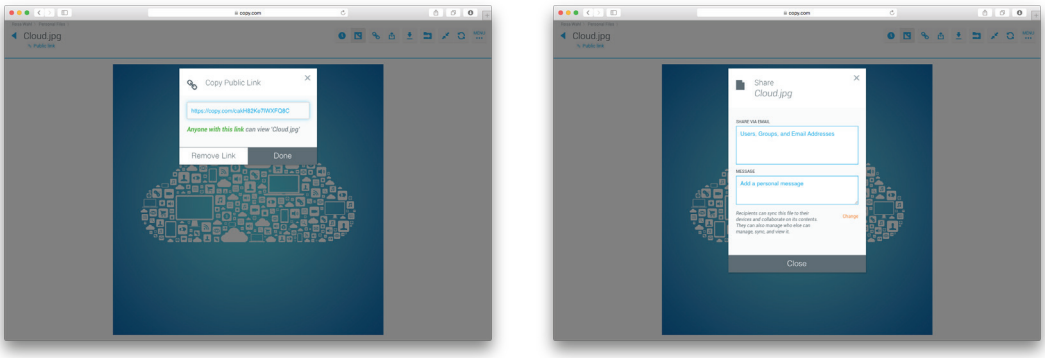


Figure 14-15. Copy Public Link- view and Share- view.

THISLIFE

Specifications	
Product name	Thislife
Service provider	Shutterfy
Operating systems	Mac, Windows, iOS, Android, Kindle
Available apps	Web, mobile
Location of the data centers	USA
Features	
Free trial	√
Free online storage	15 GB
Maximum file size limit	2 GB
Accepts various file types	X (Only photos, videos after upgrade)
Folders and nested folders	X
File versioning	X
File sharing	√
Adjustable time limit on shares	X
File import from other Cloud Storages	√
Photo Import from Social Media services	√
Collaborative functions / group spaces	X
File editing tools	√
Facial recognition	√
Tagging	√
Geotagging	√
UI theme color	Light
Large thumbnails for photos	√
Advertisement inside application	√
Security	
Requires the EULA acceptance before trying out the product	√
User's personal information will be shared with third parties	√
User's personal information will be used for advertising	√
Encrypted Storage	X
Encrypted Transfer	X

Possibility to delete the account and user data	√
Export all data after deleting an account	X

Website

Figure 1. Thislife website.

The first impression of a Thislife website is content rich, colorful and inviting due a large video looping on a background. Exploring the site in more detail quickly reveals that the main purpose of the product is to store and organize photos by using facial recognition and timelines. In can be also stated that the product is strongly targeted for families and a strong emphasis is on storing valuable memories and telling stories through them. In addition to a product screenshots displayed on a site, an informative video about the product features and how to use the product can also be viewed. This is highly beneficial for people who are willing to discover the product functionalities and the user interface before committing to the company by creating an account. While the purpose of the product and target user group can easily be distinguished, informative content about the product itself enhance the overall user experience on the site.

Thislife offers a free unlimited photo storage which is an appealing offer compared to other available Cloud storages targeted mainly for photos. In case user wants to upload videos, three paid upgrades are available from which unlimited amount of video storage costs up to $139 per year.

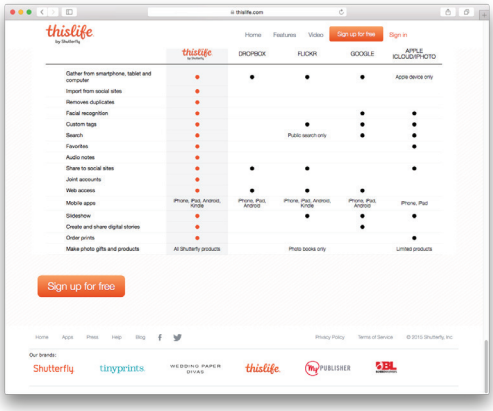


Figure 2. Comparison to other Cloud storages in the market is visible on Thislife website.

On Thislife website a comparison to other Cloud storages available in the market such as Dropbox and Google Drive, has been included to enhance the feature selection of Thislife and to ease up the selection of a Cloud storage for consumers. Although the wide selection of features is a strong selling point for the product, the fact that Thislife can only be used to store photos and videos, the comparison chart can be considered slightly misleading towards consumers.

Privacy Policy / Terms of Service

Singing up to Thislife automatically means that the user agrees to the Terms of both Shutterfy company and Thislife. A first remark when opening the Terms of Service and Privacy Policy was that a remarkably smaller font size than anywhere else on the website had been used for the documents. While it has been widely acknowledged that consumers rarely familiarize with these documents, smaller fonts makes them even harder to read while encouraging users to blindly trust the agreements without reading them first.

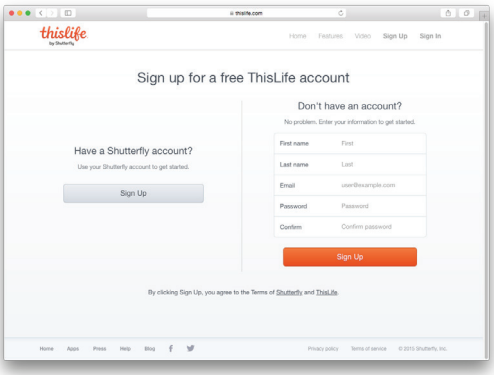
While registering to use Thislife, personal information such as name, address, phone number, email and emails stored in address book (included in the service) are collected by Shutterfy company and shared within the Shutterfy family of brands, as well as companies who work with or on behalf of Shutterfy. The gathered information can be used to advertising and promoting purposes. In case the user shares content or sends an email invitation for friends and family, the email addresses of those people are also collected albeit the company assures that these addresses will not be used for marketing.

Company as well as third party service providers are also granted access to user's device specific information such as device model, operating system, browser type, IP address, mobile phone number, mobile network carrier as well as physical location of the user.

Whenever Shutterfy invites customers to take part in surveys, promotions and contests, the collected information can be used by the company or their family of brands to "improve overall customer experience" and may be shared with third parties.

Based on the Privacy Policy document a wide range of personal information that is provided by creating the account and using Thislife is also shared with other companies. Nevertheless, in case the user is not willing to share his personal information with third parties, user is able to opt out from the list that is shared with other companies by contacting Shutterfy via email.

Account creation



Figures 3-4. Login- and account creation view.

In account creation view user's can either log in or create a new account. All of the requested fields need to be filled in order to proceed.

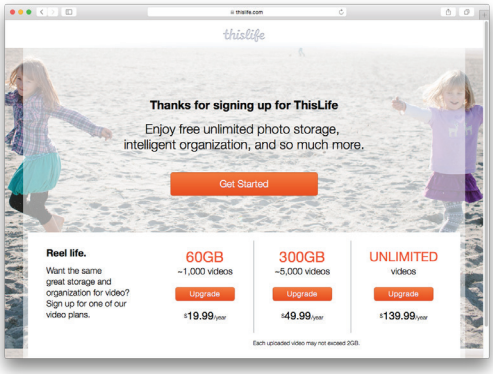
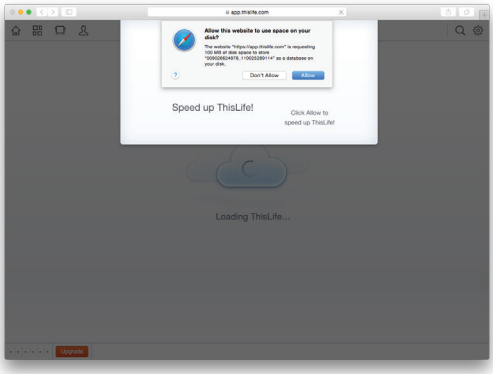
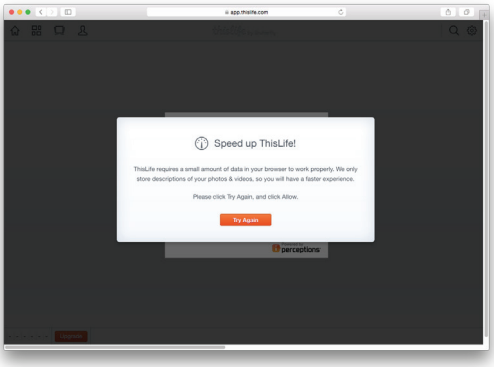


Figure 5. Thank you for signing up- view.

After creating a new account, a Get Started- view opens up. At this point user is reminded about the possibility to upload videos into the service and and provided a list of paid options to be able to do so. By pressing Get Started- button user is able to continue using the service without paying.

Taking into use





Figures 6-7. A request to use a 100 MB of disk space to store a database.

Next user is prompted with a popup window that requests to use 100 MB of disk space

to store a database called “009026624878_1110025289114” on user’s computer, in order to speed up Thislife. What exactly will be stored on user’s computer has been left untold. Incase user decides not to allow the storage, another prompt appears where user is requested to “try again” and the purpose of the database installation is explained as a place to store descriptions for photos and videos. In order to continue user needs to allow the installation of the database.

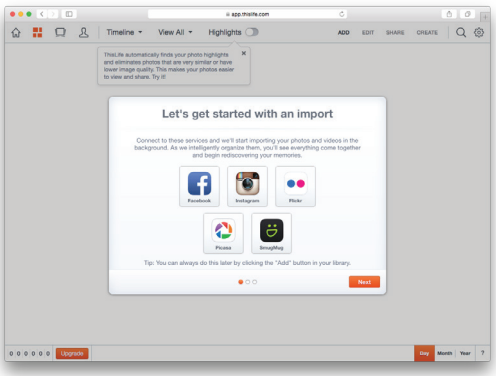


Figure 7. Onboarding wizard step one: Import photos from other services.

The next step is a onboarding wizard that introduces the ways to get started with the service. In services like Cloud storages onboarding wizards are used to enhance the user experience from the very beginning by easing up the adaptation of the service, as well as to create a basis for interaction between the service and the user. As a first step the wizard suggest importing image content from social media services such as Facebook, Instagram and Flickr. This is an optional procedure and can also be completed later on.

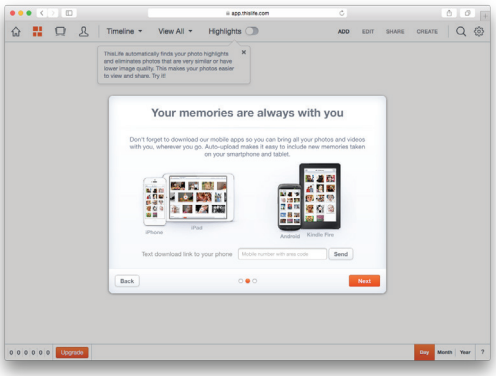


Figure 8. Onboarding wizard step two: Import photos from mobile devices.

As a second step the onboarding wizard recommends users to download Thislife mobile application to be able to upload photos into the Cloud from mobile devices. The step also introduces the auto-upload function that makes it possible to automatically sync content from mobile devices into the Cloud. To ease up the download process of a mobile app, user can insert a phone number into a specific field for the direct download link to be sent as a text message.

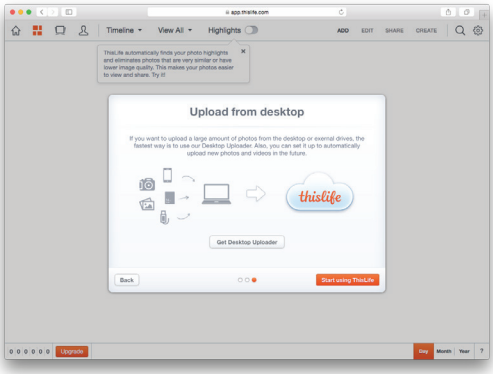


Figure 9. Onboarding wizard step three: Upload from desktop.

The last step of the onboarding wizard presents the opportunity to download and install a Desktop Uploader in case user want's to upload large amounts of photos into Thislife from personal computer. The Desktop Uploader also includes an automatic upload feature that transfers users photos into Thislife from computer when the program is opened. The automatic upload feature can be beneficial for regular users and ease up the upload process greatly. For users who have decided not to continue using Thislife, a separate program can easily be forgotten and photos can end up into the service without users awareness.

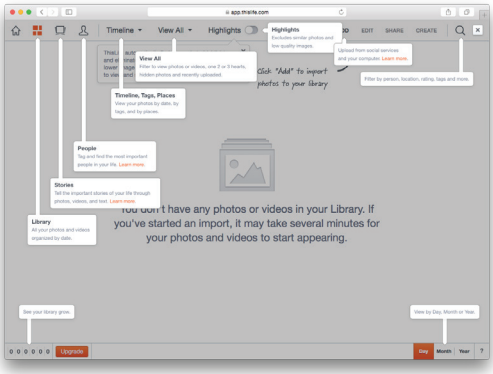


Figure 10. Tooltips to guide the frst-time user.

After onboarding wizard user lands to the main view of the application where contextual tooltips are used to present the user interface. At first glance the view looks confusing due the amount of tooltips with some overlapping each other preventing the user to be able to read the text. Clicking anywhere on the screen closes the tooltips which can be re-opened from the lower right corner of the UI.

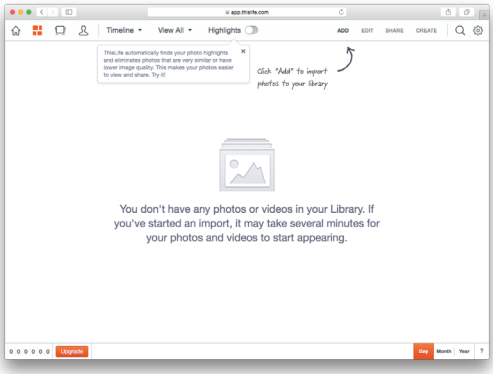


Figure 10. Main view as it appears empty.

The look and feel of Thislife UI is light, minimalistic and simple. The main navigation has been positioned on top while the amount of uploaded files and toggles for sorting files based on day, month and a year are located on the lower edge of the UI. The top menu includes views for Home, Library, Stories and People. A Timeline- dropdown view includes links to Timeline, Places and Tags- views, View All- drop down menu includes a toggle option for users to select whether all files are displayed at the same time, or only photos or videos. The top menu also includes functions to add, edit and share files, as well as a Create- function which can be used to make a story book out of the photos which can then be shared with friends and family, or order a printed copy of the book.

Adding files and folders

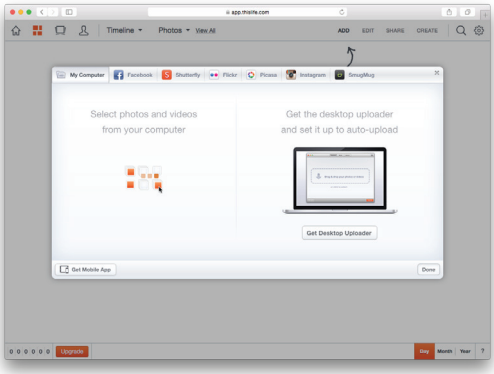
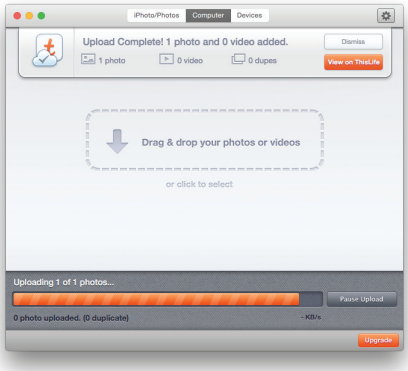


Figure 11. Add files- view.

Pressing Add opens a new window that includes an area that looks like a drag & drop-area where users can drag photos and upload them into the service. An additional Desktop Uploader- application advert together with a download- link is also visible on the view. When trying to drag photos to the view, an error appears causing user to logout the service. At this point it becomes clear that the installation of the Desktop Uploader- application is required to be able to add files to the service. When thinking about the importance of first time user experience, issues like this can have a major effect on how the user feels about the overall quality of the service.



Figures 12-13. Thislife Desktop Uploader.

To be able to use the Desktop Uploader- application, user is required to sign in to the service by using same account information that was used to login Thislife. User can select a folder or folders from which to upload content and determine whether to set up an auto-upload function for continuous upload or upload the content just once. Files could also be uploaded by a drag&drop- method.

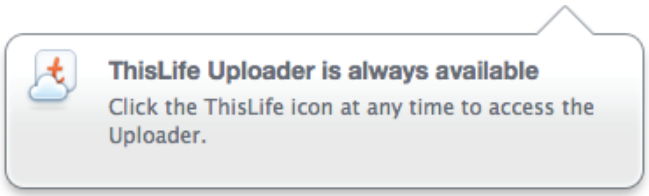


Figure 14. Access to Thislife Desktop Uploader can be easily accessed through an OS taskbar.

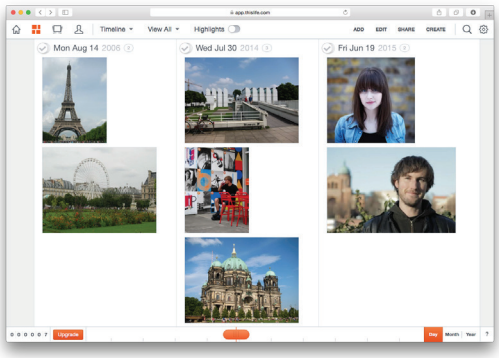


Figure 15. Uploaded files in Thislife.

A seven JPEG- images were uploaded into Thislife for testing. Other image file formats such as PNG and TIFF were not supported. Images appeared into a timeline based on the date the image was created and the view can be scrolled from left to right.

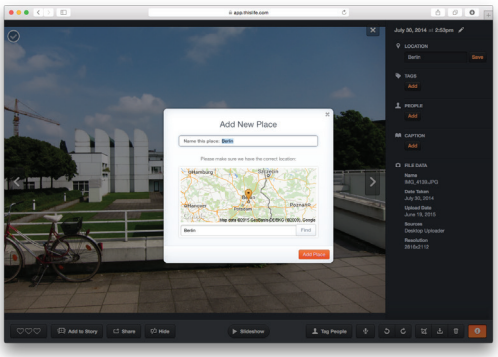
File- Specifc Actions

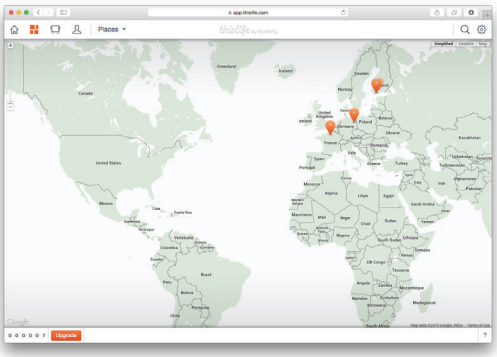
Figure 16. One file view.

Clicking a single image opens up a one file view with a side panel filled with file specific information and a lower menu providing options to share, rotate, crop, download and delete a photo as well as view images as a slideshow, add an audio file into the image, rate the image and add image into a personal story book.

Thislife offers a possibility to edit the date of the photo as well as time it was taken so

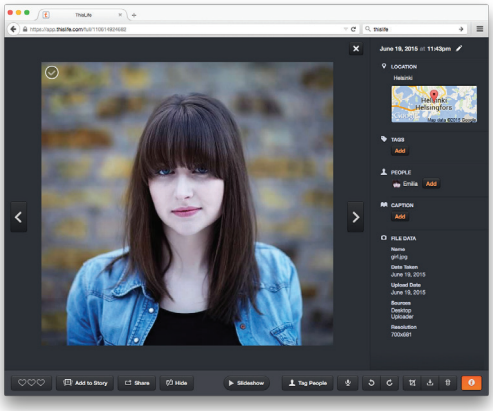
that the photos appear on the timeline as desired. This can be highly beneficial when images from different sources such as mobile phones and digital cameras, as well as scanned paper photographs are being imported into the service.

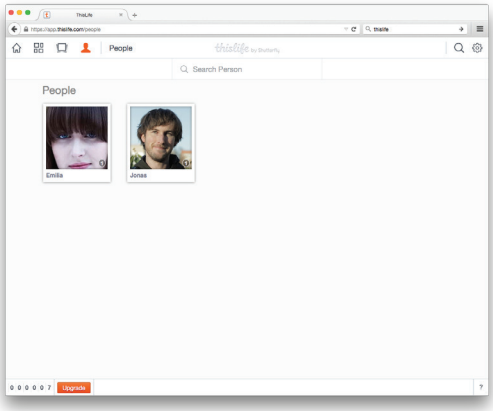




Figures 17-18. Location information of the image can be edited and added manually. Locations can be viewed through the Places- view.

In case the image metadata does not include a location where the picture was taken, user is able to add the location manually by typing the name of the place or choosing it from the map that opens up. The locations can then be viewed from the Places-view located in the top menu. This feature can be considered beneficial especially for people who are traveling a lot and want to organize photos based on locations they were taken.





Figures 19-20. Facial recognition can be used to sort photos based on people.

Photos can also be sorted based on people appearing in them by using an automatic facial recognition or adding the information to photos manually. Tagged people can be viewed through a People- view located in the top menu bar.

Even though Thislife does not offer a traditional folder structure to organize photos, using locations and facial recognition is a fresh way to sort photos and it can be appealing for many consumers. Nevertheless, for people who are dealing with a large amounts of photos adding information to photos manually is a laborious and time consuming task although, as discovered when discussing with people using Thislife, a highly addictive.

MEDIAFIRE

Specifications	
Product name	MediaFire
Service provider	MediaFire
Operating systems	Mac, Windows, iOS, Android
Available apps	Web, mobile
Location of the data centers	USA
Features	
Free trial	√
Free online storage	10 GB
Maximum file size limit	20 GB
Accepts various file types	X
Folders and nested folders	√
File versioning	√
File sharing	√
Adjustable time limit on shares	X
File import from other Cloud Storages	X
Photo Import from Social Media services	X
Collaborative functions / group spaces	√
File editing tools	√
Facial recognition	X
Tagging	X
Geotagging	X
UI theme color	Light
Large thumbnails for photos	√
Advertisement inside application	√
Security	
Requires the EULA acceptance before trying out the product	√
User's personal information will be shared with third parties	√
User's personal information will be used for advertising	√
Encrypted Storage	√
Encrypted Transfer	√
Possibility to delete the account and user data	X
Export all data after deleting an account	X

Website

Figure 1. MediaFire website.

First impressions of the MediaFire website are youthful, fresh and graphically inviting. Main features have been presented through a short core sentences together with vector images instead of screenshots of the actual product.

Based on the website MediaFire is for everyone, from students to creative professionals and for larger companies. One of the main selling points that has been emphasized on the website is the large amount of accepted file formats (more than 200). A strong emphasis is also on file sharing and collaborating with friends and co-workers. Besides these features safety and security aspects have also been highlighted. Apart from the amount of accepted file formats, a unique selling point that distinguish MediaFire from other Cloud storages available on the market is missing. Together with missing images of the actual product and user interface, the service might not seem appealing enough for many consumers looking for a Cloud storage to stick with.

Privacy Policy / Terms of Service

By using MediaFire user accepts the both Privacy Policy and Terms of Service-agreements. By doing so a permission is granted for the company to collect various kind of personal information about the user such as IP- addresses, browser type and language, account activity and accessed pages. This type of information is handled as non-personally identifiable information and may be shared with third parties. In case user chooses to share or collaborate files with others, the email addresses and other available information of the other parties will also be collected.
What is embodied by the company as personally identifiable information is the information about specific individual such as name, address, phone number and email address. This type of information will not be shared with third parties but may be used by the company to correspond user via email and offer software updates.
In Terms of Service document it has been stated that whatever content is being uploaded into MediaFire, all of the ownership rights are retained by the user, and that the service does not claim any rights to any of the user's content. Still the Privacy Policy document claims that "Any Content uploaded by you to MediaFire becomes published Content and is not considered personally identifiable information subject to this Privacy Policy." While the Privacy Policy states that a personally identifiable information will not be shared with third parties, the document grants rights for MediaFire to access and

share users personal content with other companies. This can be considered a serious privacy threat for consumers who are storing sensitive content into the service and are unaware of the content of the Privacy Policy.

In Privacy Policy MediaFire states that the company cannot ensure or warrant the security of any information provided by the user as it is up to the user's own risk to do so. The document also states that in case MediaFire is acquired, sold or merged with a third party entity, users personal information that has been gathered will transfer as a part of the change of control. Also in case of a bankruptcy MediaFire may not be able to control how users personal information is treated, transferred or used.

Account creation

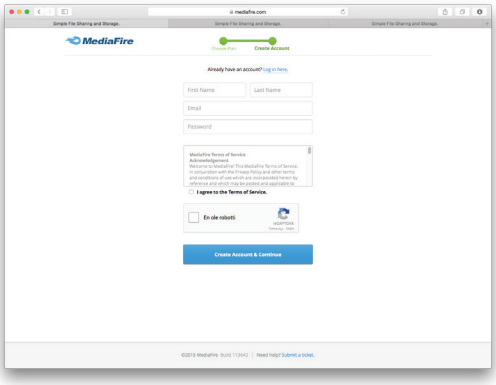


Figure 2. Account creation view.

During account creation, full name, email and password are required. The Terms of Service- document is visible while the account is being created. Privacy Policy can be accessed only through the main web page.

Taking into use

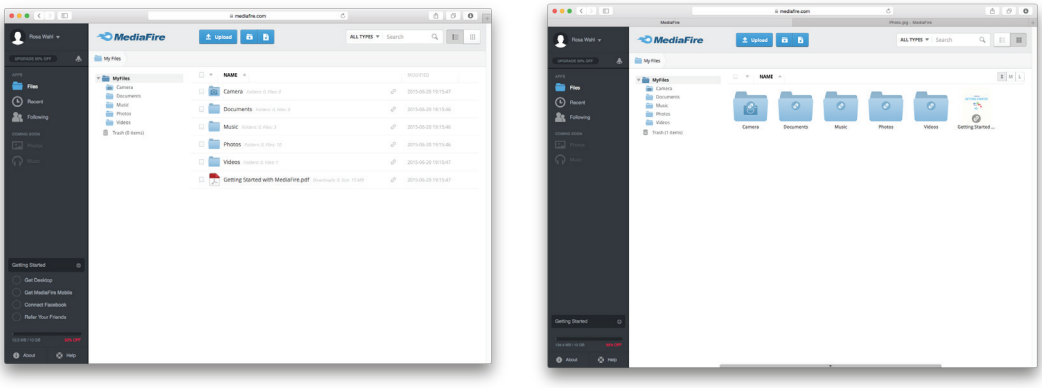


Figure 3-4. Main user- interface. Files can be viewed by using a list view or a thumbnail view.

After login user lands to the main view of MediaFire. An onboarding wizard or other guidance about how to begin using the service have been replaced with a Getting Started With MediaFire.pdf that consists of eleven pages. For users not being able to begin using the service immediately after installation can have a significant effect

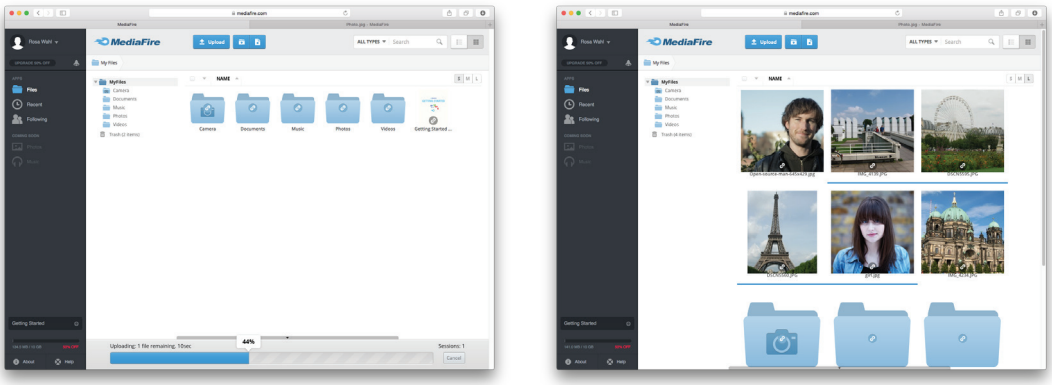
on the user experience. Requesting users to familiarize with a manual is an outdated method to introduce an online service targeted for general consumers.

The user interface consists of a content area, a top menu bar and a side menu. The content area includes two menus, one on the left and one on the right with a same folder structure: Camera, Documents, Music, Photos and Videos. Since no files has been uploaded yet, the purpose of these identical folder structures can easily be unclear for the first time user.

User is able to toggle between a list view and a thumbnail view to display content. In case the thumbnail view has been selected, size of the thumbnails can be adjusted to be either small, medium or large.

The color of the top header bar as well as the color of the MediaFire logo can be customized through a Customization- tab found in the side panel drop down- menu. In case the user has paid for the premium account, a custom logo can be used to replace the MediaFire logo.

Adding Files and Folders



Figures 5-6. Files being uploaded into MediaFire and uploaded photos. Size of the thumbnails can be toggled between small, medium and large.

Files can be added to the service by using a drag&drop function that shows the upload process of the file being uploaded. Folders can be added from the top menu.

File Specific Actions

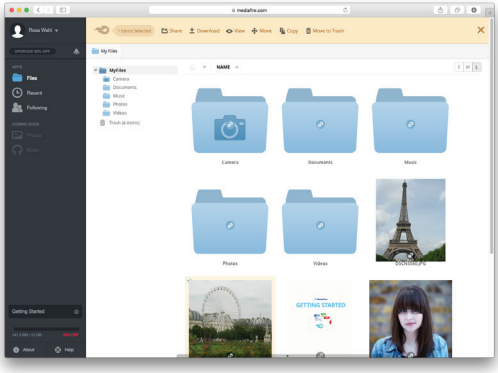


Figure 7. File-specifc actions.

Selecting an individual file reveals an additional top menu with options to Share, Download, View, Move, Copy and Move to Trash.

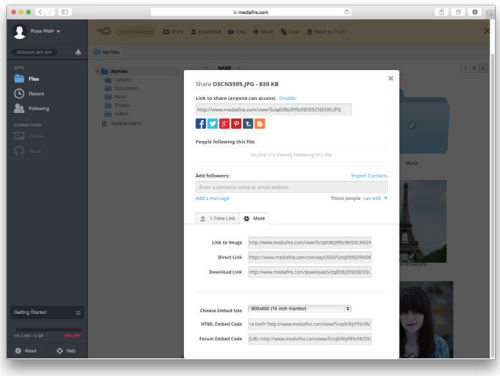


Figure 8. MediaFire offers a wide range of options to share content.

MediaFire offers various ways to share files. One of the methods is to create a public link which can be disabled when user wants to end the share, or a 1-time download-link that makes it possible for the receiver to download the file once. Other methods include sharing through social media services such as Facebook, Twitter and Pinterest and also through blogging platforms such as Blogger and Tumblr. MediaFire also offers a direct HTML Embed Code and a list of embed image sizes. This is a beneficial feature for example people who are building websites and need a place to store their images and videos.

As a collaborative feature a followers can be added to individual files for them to be able to view and edit the files. In order for the collaboration feature to work, the followers need to be users of MediaFire.

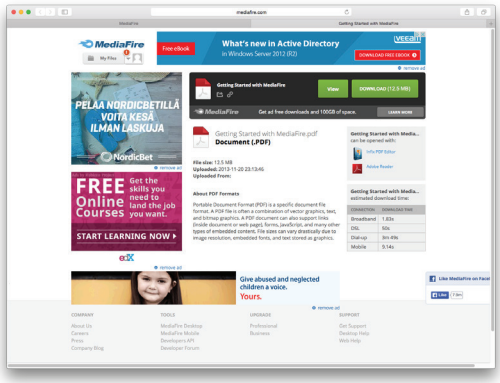


Figure 9. Download view.

When a file is being downloaded, a new browser tab opens and user is transmitted to a website full of advertisement with a Download- button in the middle. Looking like a regular unwanted popup advertisement from third party, the download page is lacking the feeling of security and user might feel uncertain about whether it is safe enough to download the file.

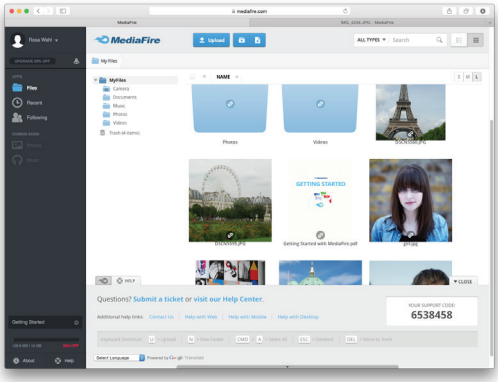


Figure 10. Submit a ticket- feature.

An interesting feature in MediaFire is the capability to “submit a ticket” within the web client to the help center in case of questions or errors occur when using the service. User is granted a personal support code that makes it possible for the service provider to recognize the exact version of the application that has been used and also for the user to follow the process of the problem solving. In case the user is able to reach the service providers effortlessly and receive help in a short period of time, a feature like this can have a major impact to the user experience and increase the trust towards a service provider remarkably.

Figure 11. One file- view.

In one file view user is able to share, download, rotate, zoom and rename a file. An advertisement to upgrade to the pro or business plan is displayed on the top right corner.

IRISTA

Specifications	
Product name	Irista
Service provider	Canon
Operating systems	Mac, Windows
Available apps	Web
Location of the data centers	Europe
Features	
Free trial	√
Free online storage	15GB
Maximum file size limit	X
Accepts various file types	X
Folders and nested folders	√
File versioning	X
File sharing	√ **(only through social media)**
Adjustable time limit on shares	X
File import from other Cloud Storages	X
Photo Import from Social Media services	√
Collaborative functions / group spaces	X
File editing tools	√
Facial recognition	X
Tagging	√
Geotagging	X
UI theme color	Dark
Large thumbnails for photos	√
Advertisement inside application	X
Security	
Requires the EULA acceptance before trying out the product	√
User's personal information will be shared with third parties	√
User's personal information will be used for advertising	√
Encrypted Storage	X
Encrypted Transfer	X

Possibility to delete the account and user data	√
Export all data after deleting an account	X

Website

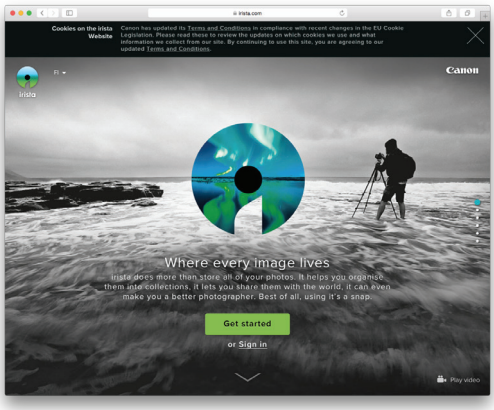


Figure 1. Irista website.

Irista is a Cloud storage offered by Canon which is targeted for photographers to store and organize photos. Irista has been available in the market from mid 2014 and as a rather new service still fairly unknown for many consumers (statement based on the survey conducted with 47 respondents).

The web page is both interesting and appealing due the animated transitions and appealing photographs on the background. The main focus of the site is to emphasize the simplicity of the product, multi-device access as well as sharing options. Nevertheless the web page is fairly uninformative due the lack of information about the actual product such as included features, pricing and storage capacity amongst others.

Privacy Policy / Terms of Service

Both Privacy Policy and Terms of Service- documents are reader friendly with a sufficient font size and document length. The user information gathered by Canon consist of the information user has provided in forms of website forms or corresponding with the company via phone, email or otherwise. This includes information provided during the account creation, while participating on discussion forums, competitions or surveys as well as reporting product errors. The gathered information consists of name, address, email address, phone number, personal description and photograph as well as financial and credit card information. The collected information will be used to advertising, notifying changes in products and to provide quality services to users. The information may also be shared with third parties such as business partners, suppliers and subcontractors, as well as analytics and search engine providers assisting the company in the improvement and optimization of the web site. In case user is not willing to share personal data for marketing purposes or third parties, sending an email to Canon will prevent such processing.

Canon will not claim rights to the content that has been uploaded into the service

but will use it for the purpose of providing the Irista service to users. Nevertheless by uploading content to Irista the company (and the ones the company works with) will be granted a free, non-exclusive, worldwide, sub-licensable right to use, publish, reproduce, host and store user's materials for the purpose of providing the Irista service to users.

In case of corporate acquisition, all of the user's data will become part of the assets being transferred. If the content of Privacy Policy or Terms of Service is changed, the company is entitled to do so but users will be notified about it at least 60 days in advance.

Account creation

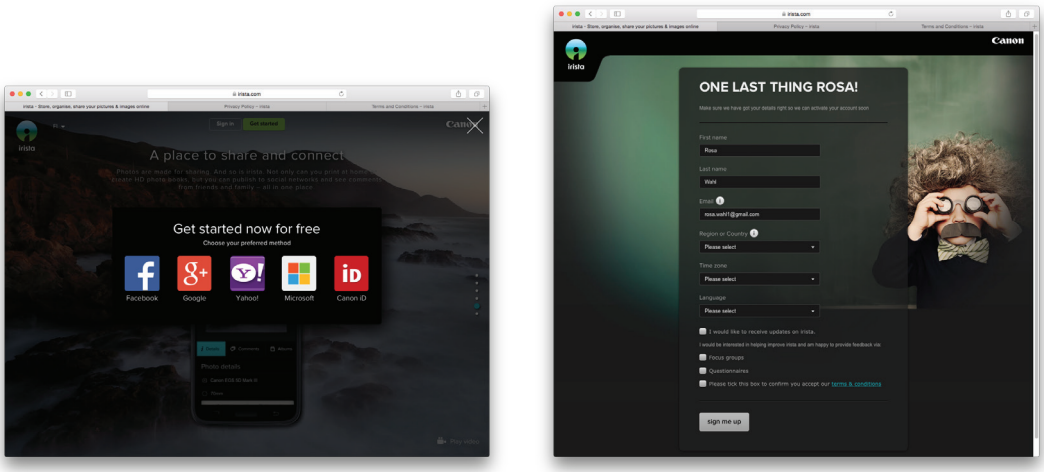


Figure 2-3. Different signup methods and a user data form.

To create an account user is offered a chance to sign up by using existing social media accounts such as Facebook, Google + and Microsoft, as well as creating a new Canon iD. For the purpose of this thesis, a Facebook login was used. After logging in a user data form needed to be filled in order to proceed.

Taking into use

Figure 4. A view after signup.

After signup, a *let's get started!' view is opened with a welcome message and a video which includes instructions on how to upload photos by using a desktop- and a web uploader, and also a full overview of the features included in Irista Cloud. For users who are new with the service, a full feature video is a great method to introduce the product and it's capabilities in an appealing and interesting way.

Adding Files and Folders

User is able to upload photos to the service by using a desktop- uploader which can be downloaded from the main view of the service, or via web upload.

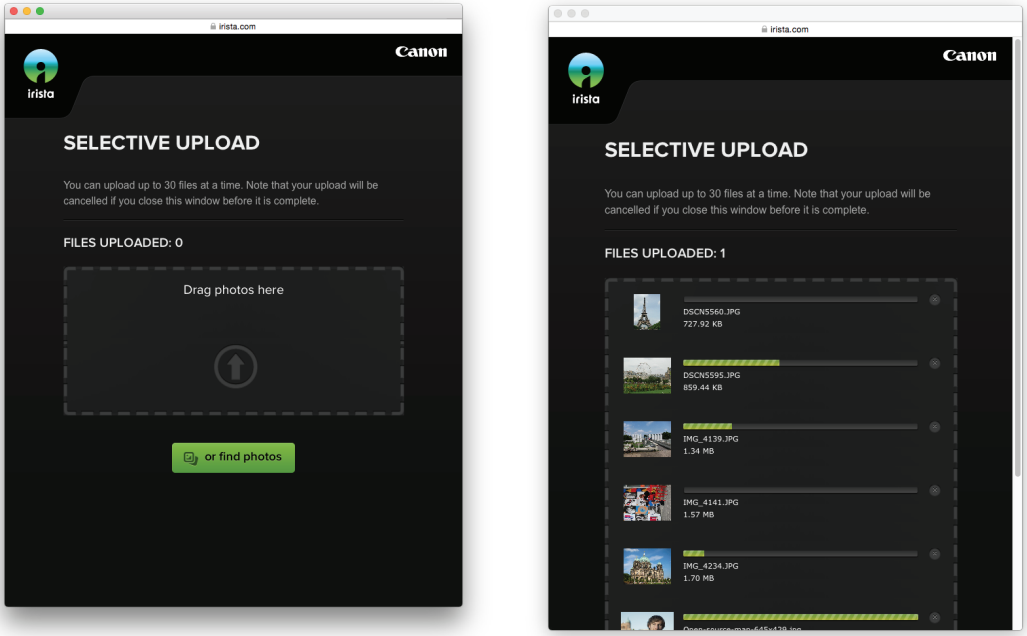


Figure 5. Web upload view and upload process view.

When choosing a web upload, a separate floating window opens. Files can be added by a drag&drop method and up to a 30 files at a time, or by opening a OS- finder and selecting the photos from the computer.

Since today majority of consumers are using system cameras also to shoot videos, one cannot stop wondering why Canon has decided to eliminate the video format from Irista and only accept photographs to be uploaded.

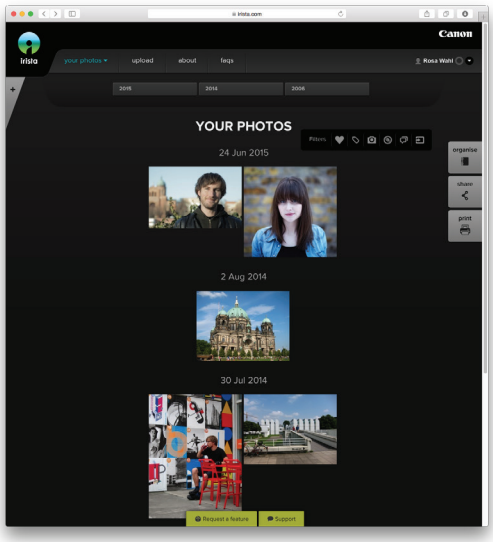


Figure 6. Your Photos- view.

Photos appear to service as thumbnails in Your Photos- view, automatically organized by years and dates. The view includes several menus for user to navigate inside the service, which makes the view look slightly confusing at first. However, in case of not knowing what to do user is able to return to the main view and seek reference from the comprehensive feature video.

The top menu bar includes a drop down menu named Your Photos (current view) with options to view latest uploads, view albums as well as order a printed book of the photos. The top menu also includes actions to upload content from social media services such as Facebook, Flickr and Google+. Another menu bar which is located in the content area of the Your Photos- view is called ‘Filters’ which includes options to favorite, tag, and also to filter photos based on camera model, lens and a social media source. A small menu that appears on the right side of the view provides options to organize, share and print content. Options for organizing content includes albums, tags and adding a file to ‘favorites’ which can all be used while searching an individual or group of files within the service.

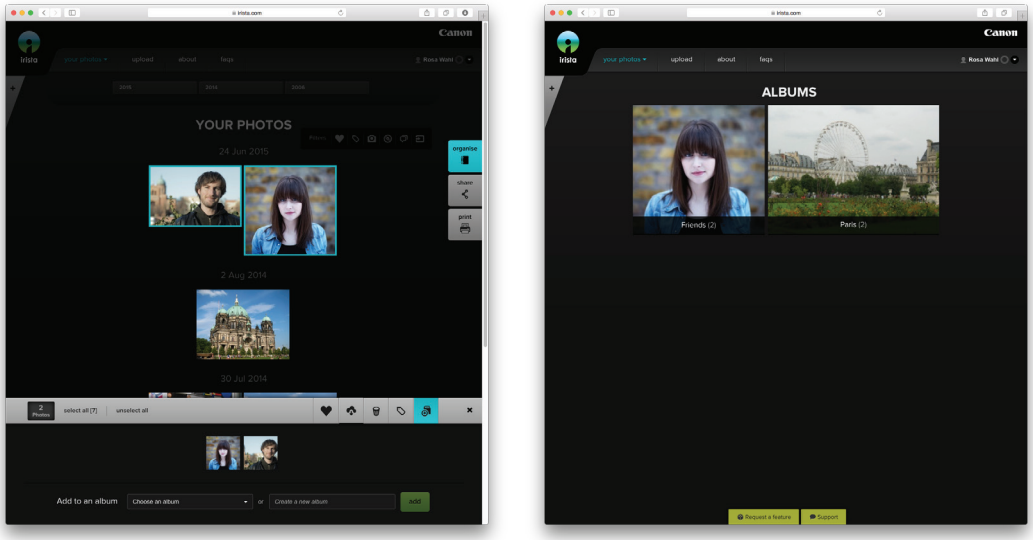


Figure 7-8. Left: A panel that offers various options to sort and organize content. Right: Album view.

File Specific Actions

Sharing a file is similar to creating albums and tagging, with the exception that files can be shared straight by hovering the thumbnail which reveals a hidden menu with the share- function. What differentiated Irista from many of the competitor services is the fact that files can be shared only through Facebook, Flickr and Google+, not by using a direct link or a link embedded to email. As this sharing limitation is not mentioned on the website, for it to be revealed through the usage of the product can have a major downfall to the overall user experience for consumers who are looking for a versatile photo storage to share their photos.

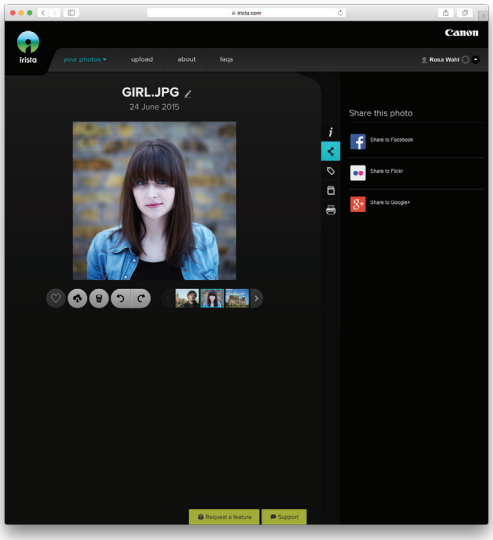


Figure 9. Files can be shared only through a limited amount of social media services.

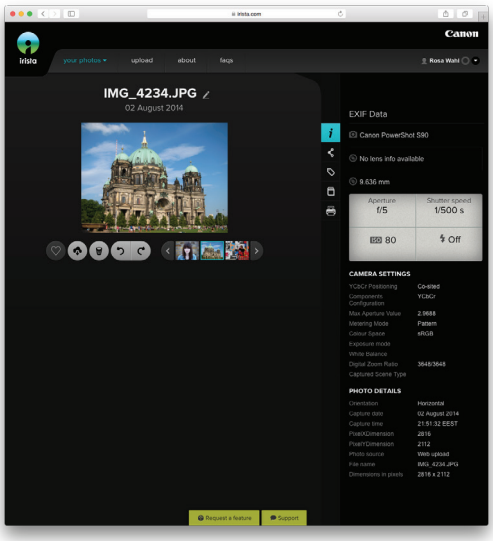
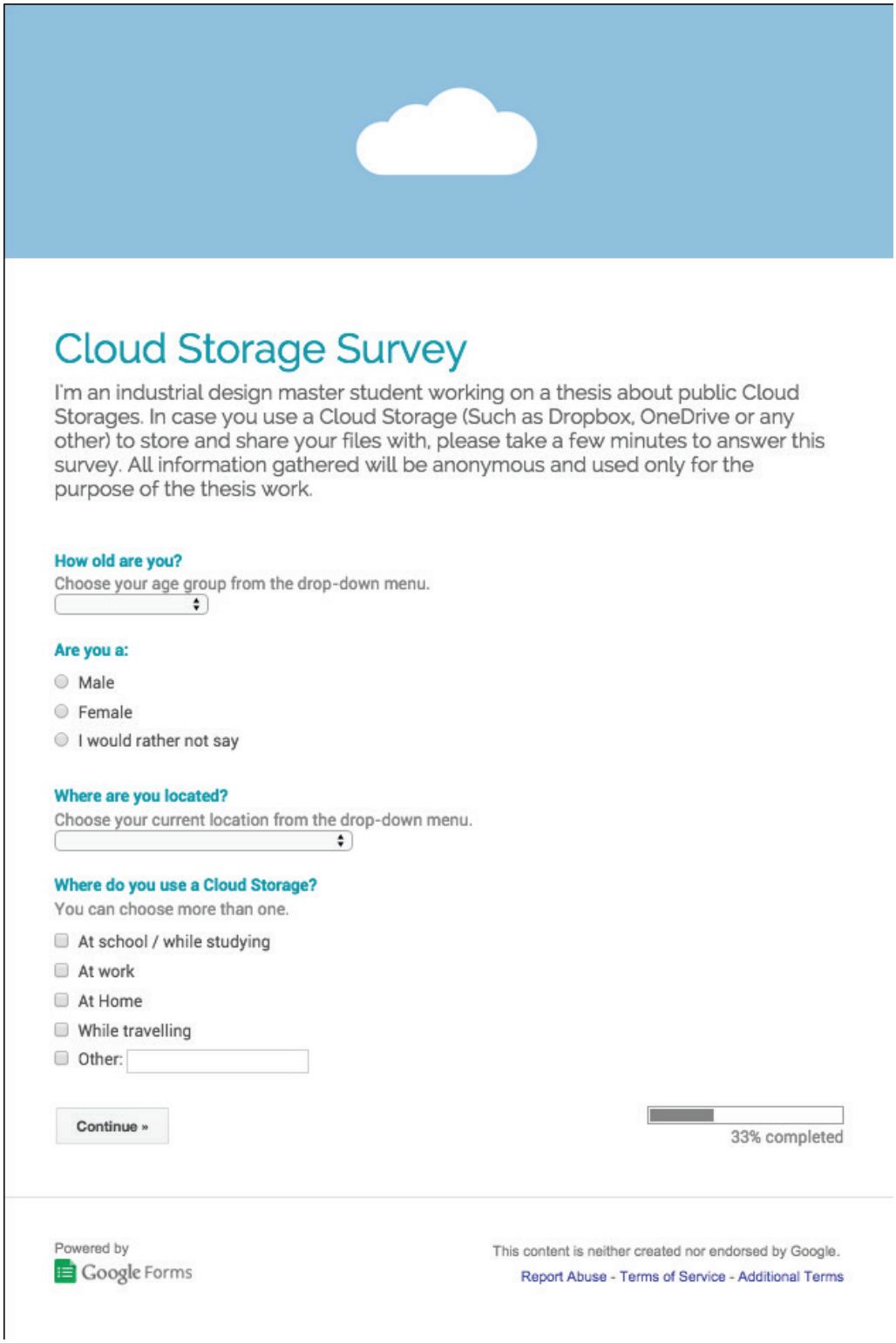


Figure 10. A wide amount of information is shown for photos taken with a digital camera.

Opening a photo that has been taken with a digital camera displays a wide amount of details about the photo and the camera settings that were used. Information such as shutter speed, aperture as well as the camera model and lens that has been used are visible and different photos can easily be compared by using the film strip menu that is located underneath the picture.

2. Cloud User Survey



Cloud Storage Survey

I'm an industrial design master student working on a thesis about public Cloud Storages. In case you use a Cloud Storage (Such as Dropbox, OneDrive or any other) to store and share your files with, please take a few minutes to answer this survey. All information gathered will be anonymous and used only for the purpose of the thesis work.

How old are you?
Choose your age group from the drop-down menu.

Are you a:
- Male
- Female
- I would rather not say

Where are you located?
Choose your current location from the drop-down menu.

Where do you use a Cloud Storage?
You can choose more than one.
- At school / while studying
- At work
- At Home
- While travelling
- Other:

Continue »

33% completed

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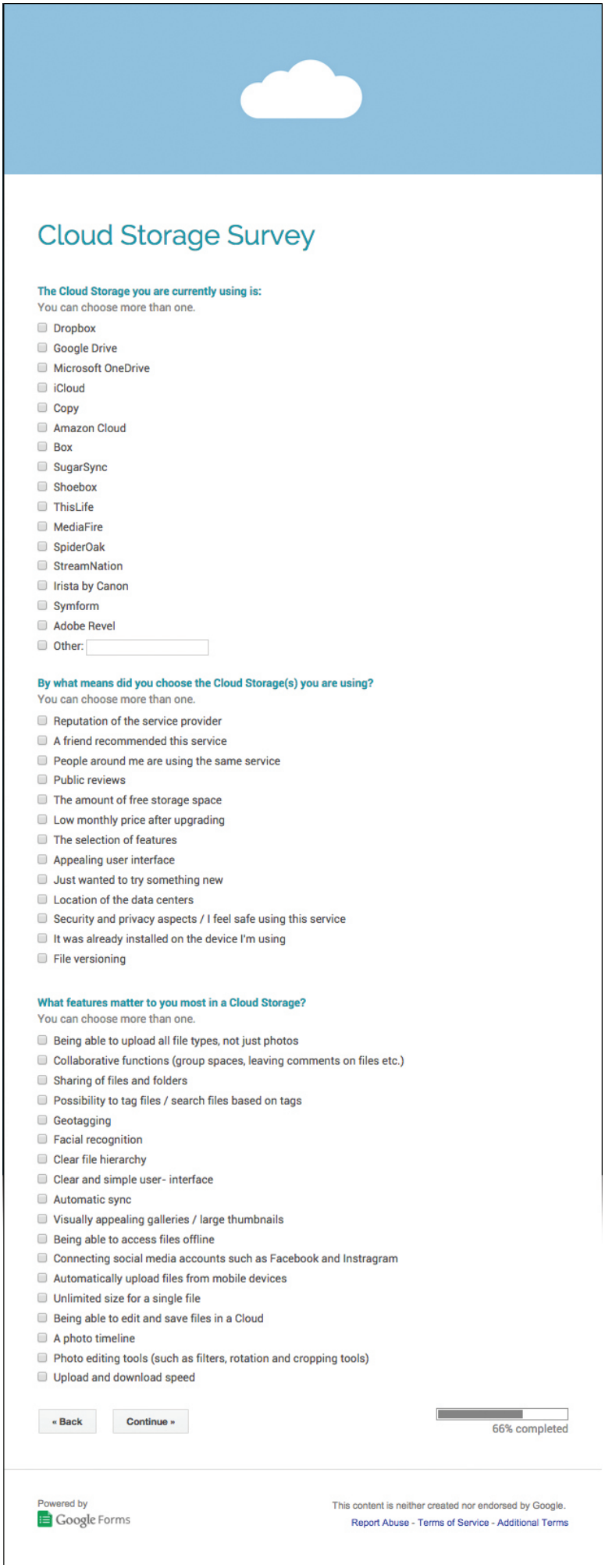

Cloud Storage Survey

The Cloud Storage you are currently using is:
You can choose more than one.

- [ ] Dropbox
- [ ] Google Drive
- [ ] Microsoft OneDrive
- [ ] iCloud
- [ ] Copy
- [ ] Amazon Cloud
- [ ] Box
- [ ] SugarSync
- [ ] Shoebox
- [ ] ThisLife
- [ ] MediaFire
- [ ] SpiderOak
- [ ] StreamNation
- [ ] Irista by Canon
- [ ] Symform
- [ ] Adobe Revel
- [ ] Other:

By what means did you choose the Cloud Storage(s) you are using?
You can choose more than one.

- [ ] Reputation of the service provider
- [ ] A friend recommended this service
- [ ] People around me are using the same service
- [ ] Public reviews
- [ ] The amount of free storage space
- [ ] Low monthly price after upgrading
- [ ] The selection of features
- [ ] Appealing user interface
- [ ] Just wanted to try something new
- [ ] Location of the data centers
- [ ] Security and privacy aspects / I feel safe using this service
- [ ] It was already installed on the device I'm using
- [ ] File versioning

What features matter to you most in a Cloud Storage?
You can choose more than one.

- [ ] Being able to upload all file types, not just photos
- [ ] Collaborative functions (group spaces, leaving comments on files etc.)
- [ ] Sharing of files and folders
- [ ] Possibility to tag files / search files based on tags
- [ ] Geotagging
- [ ] Facial recognition
- [ ] Clear file hierarchy
- [ ] Clear and simple user- interface
- [ ] Automatic sync
- [ ] Visually appealing galleries / large thumbnails
- [ ] Being able to access files offline
- [ ] Connecting social media accounts such as Facebook and Instragram
- [ ] Automatically upload files from mobile devices
- [ ] Unlimited size for a single file
- [ ] Being able to edit and save files in a Cloud
- [ ] A photo timeline
- [ ] Photo editing tools (such as filters, rotation and cropping tools)
- [ ] Upload and download speed

« Back Continue »

66% completed

Cloud Storage Survey

What features are missing in the Cloud Storage(s) you are currently using, that you would like to be included?

You can choose more than one.

- [ ] Being able to upload all file types, not just photos
- [ ] Collaborative functions (group spaces, leaving comments on files etc.)
- [ ] Sharing of files and folders
- [ ] Possibility to tag files / search files based on tags
- [ ] Geotagging
- [ ] Facial recognition
- [ ] Clear file hierarchy
- [ ] Clear and simple user- interface
- [ ] Automatic sync
- [ ] Visually appealing galleries / large thumbnails
- [ ] Being able to access files offline
- [ ] Connecting social media accounts such as Facebook and Instragram
- [ ] Automatically upload files from mobile devices
- [ ] Unlimited file size for a single file
- [ ] Being able to edit and save files in a Cloud
- [ ] A photo timeline
- [ ] Photo editing tools (such as filters, rotation and cropping tools)
- [ ] Better upload and download speed
- [ ] File versioning

How often do you switch a Cloud Storage / start to use a new one?

- ○ Never / I have only used one
- ○ Once every 3-4 years
- ○ Once a year
- ○ 1-2 times a year

How much do the privacy and security aspects in Cloud Storages worry you?

	1	2	3	4	5	
A lot	○	○	○	○	○	Not at all

Do you ever read the Terms of Service (EULA) before installing a new application?

- ○ Yes
- ○ No

« Back Submit

100%: You made it.

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